Gotharman's FuZion

Music WorkStation

User Manual V 10.60

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Introduction

Thank you very much for purchasing/consider to purchase a Fuzion Music WorkStation.

The goal with Fuzion was to design a workstation that was fast and intuitive to compose music with.

Unlike many other music workstations, Fuzion does not work in different ”modes”. On Fuzion you can edit a sounds, jump to the sequencer and record or edit, edit the effects, everything while the sequencer keeps running. You do not have to switch between different modes, where you can’t edit the sounds in one mode, and can’t record a sequence in another. On Fuzion ALL parameters and functions are accessible at ANY time!

The first thing I designed, was its sequencer. This has 16 tracks, that each can be set to control Fuzion's internal sound engine, or any MIDI gear connected to its 2 MIDI outputs, can have separate lengths up to 128 bars, can have separate quantize/clock settings, changable on the fly, while the sequencer is running, has a Note Randomizer for each track, and a global Swing sequencer. Tracks can be recorded either in real time, grid mode, where you insert notes in a piano roll style window, or step insert mode, where a pointer can be moved around on the piano roll, and it places all received events at the position of this pointer. All MIDI events, like notes, CC's, aftertouch and program changes can be recorded.

In the recent update, it is also possible to record 8 audio tracks into the sequencer.

For editing the recorded MIDI events, different methods are available, depending on the type of event, you want to edit. I early learned, that editing notes in a piano roll, that might work on a computer, did not really work as an intuitive method on this little box. Therefore I engineered the "Bars" edit method, where notes, velocity values, lengths and positions are presented as "bars" that changes colour when the note are played back, and that can be edited using knobs, in a kind of analogue sequencer style fashion. I think that this system works really well for experimenting with a composition.

When editing MIDI CC's and aftertouch events, these are presented as values in a frame, one bar at a time. 8 of these values can be selected at a time, and the selected values are presented as the same kind of bars used in the note edit system, and can be edited using knobs.
When editing program changes, these are presented on an event list.
It is possible to copy events between tracks and presets, and to erase specific events, a whole track, or the whole sequence.

The next thing I designed was the synthesizer engine. This was designed to be flexible with many sound possibilities, while at the same time being easy to tweak. It has one screen per module (one for the oscillator, one for the filters and so on...), and each module can be selected by the push of a button. Furthermore a "Sound Finder" was engineered, that makes it easy to audition and import sounds from any other preset, to the one you are working on now. A Fuzion oscillator can be a virtual analogue waveform one, a virtual percussion oscillator, a sampling or an audio input. The oscillator can be processed by 2 filters with each 18 filter types, including 2 parametric EQ types, an amp, an instrument effect, 2 LFO's and 3 envelopes. Fuzion has 8 synthesizers built in, and all sounds, except for audio inputs, can be played back chromatically from a connected MIDI keyboard

over the full 10 octave MIDI note range, triggered from the built-in touch screen keyboard, or triggered from an assignable button. Fuzion's sound engine is designed to sound good, with 24 bit converters and 32 bit internal processing.

A sampler part was also designed, to make it possible to record and edit samplings. Sample playback is performed through the synthesizer engine.

2 global effects processors were also added that will have reverbs, delays, pitch effects and granular effects.

An instrument effect for each of the 8 synthesizers, were added, that will have effects like FAT, distortion, compressor and others.

USB was also added to make it possible to import and export .wav files and presets, to back-up your work, and for updating the Fuzion firmware.

To make everything work as fast and effective as possible, Fuzion is not programmed behind any "OS". Everything is performed directly by the processor, and everything is programmed in assembly language, which is up to 30 times more effective than the C++ language, that most people program in, and it is programmed specificly for the Fuzion hardware.

Very special thanks to:

Christopher Curtis
Timo Reichert
Gene Schwartz
Rashad Becker
Perfect Circuit Audio

For supporting this project from the beginning. I really appreciate your trust. Without you, Fuzion might not have been…

Gotharman July 2015

Getting Started

Connecting:

On the right end panel of your Fuzion, you will find the power switch, connections for power supply, and 2 audio inputs and 4 outputs. The outputs are stereo paired. Output 1 and 3 are right channels and output 2 and 4 are left channels.

Since on most of the presets, all audio are directed to output 1 and 2, you would probably want to connect these to a mixer or an amplifier, or anything else that ends out in a set of speakers, a single speaker, or even a pair of headphones, if you are in a neighbour friendly mood. Since Fuzion doesn't have build in speakers, it just needs to be connected to something, that can transfer its amazing sound to you.

Connect the other outputs to effects processors, filters, computers or anything else that can process sound. Connect the outputs of these back to Fuzion's inputs, for mixing to the main outputs or further processing inside Fuzion.

Stereo headphones can be connected to Out1 (hp) and Out3 (hp) to monitor either output 1 and 2, or output 3 and 4.

Any line level audio gear can be connected to Fuzion's 2 audio inputs. It is possible to sample and to process any audio presented on these, using Fuzion's filters and effects.

On the left end panel of your Fuzion, you will find the USB connector and two sets of MIDI in and out.

You will need to connect a MIDI keyboard to MIDI input 1, in order to take full advantage of Fuzion's fully chromatically playable sounds.

As it is at writing moment, it is preferable to connect a keyboard and/or other MIDI controlling things to MIDI in 1, and to use MIDI in 2 if you need to MIDI sync Fuzion to other gear.

Reason for this is, that MIDI in 2 is not fully spec'd yet, but it will be in an update very soon.

To MIDI out 1 and 2, you should connect the gear you would like to control with Fuzion's sequencer.

If you plan to connect more than 2 MIDI devices, it would be preferable to use a MIDI-thru box, to avoid long MIDI delays.

To the USB connector, a USB drive can be connected.

This should be:
-Maximum 32 GB
-DOS formatted

With a USB drive connected, you can:
-Import, export and back up samples as .wav files
-Import, export and back up Fuzion presets
-Update Fuzion

To import a .wav file from another device, it must be:
-Mono or stereo
-44.1 KHz sample rate –Fuzion will import other sample rates, but they will play back in a wrong speed
-16 bit native PCM

Connect the supplied power adaptor to the Power input, and to a 100V to 240V power source.

I.T.E POWER SUPPLY
MODEL : HK-A2-090A200-CP
INPUT : 100-240V ~ 50/60Hz 0.8A
OUTPUT : 9V 2.0A
CAUTION: RISK OF ELECTRIC SHOCK
DRY LOCATION USE ONLY
MADE IN CHINA

It’s a 9V, minimum 1A type with a 2.1 mm DC plug, with positive middle.

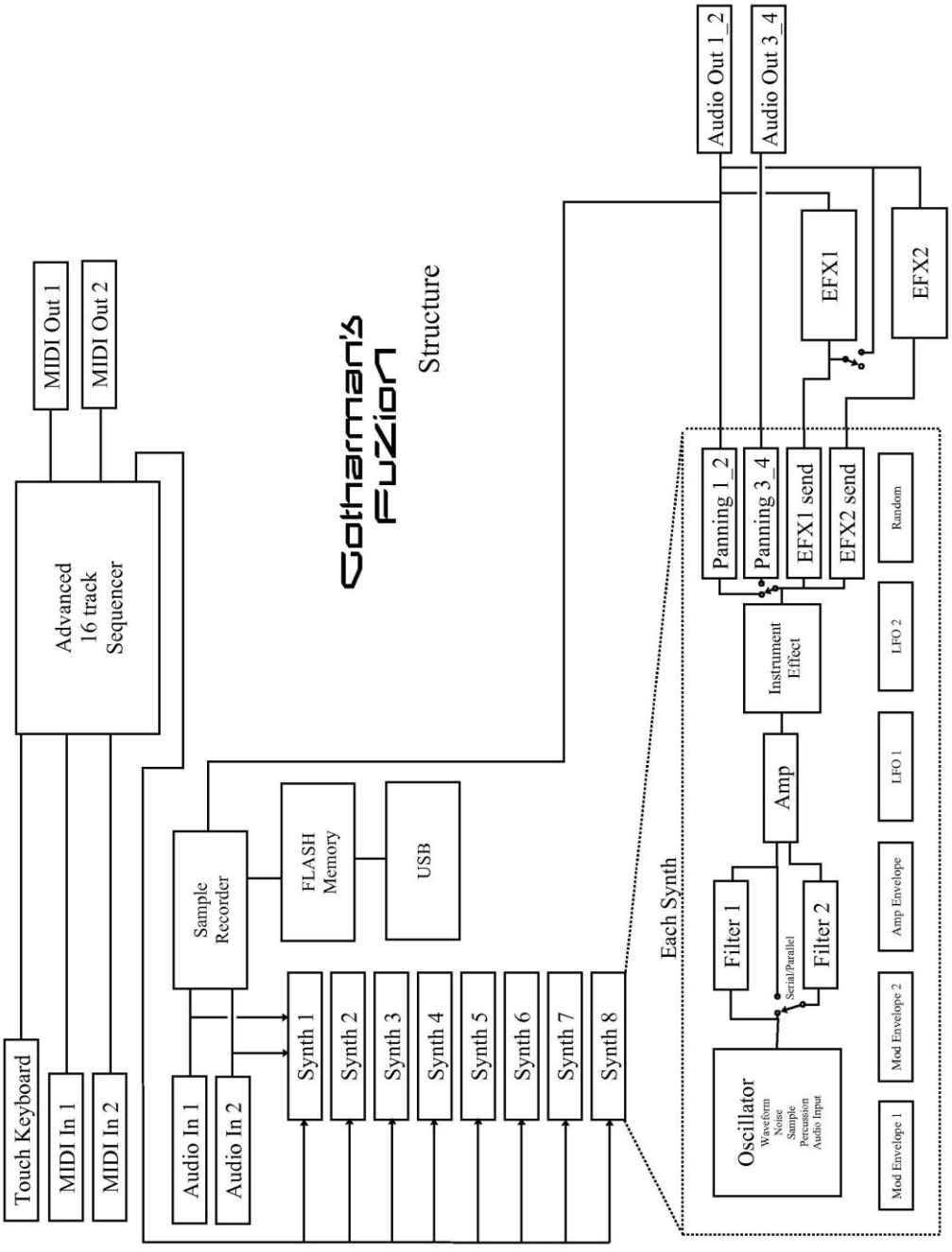
Some Fuzion’s has been shipped out with a power adaptor, that has multiple tips. If you have received one of these, you should use the tip with the blue ring, and make sure that the 2 parts are alligned to the text “Tip”:

Please look at the picture, on the next page….

Turn it on

Toggle the power switch on the right end panel, so its pin is pointing down. Your Fuzion should now turn on.

Fuzion Structure



The sequencer is the ”heart” of Fuzion. When you want to play the internal synthesizer’s or control MIDI gear through Fuzion, you must go to the sequencer, and channelize the MIDI input and the Touch Keyboard first.

The Touch Keyboard and the 2 MIDI inputs are connected directly to the sequencer’s input. All operations on gear connected to the MIDI inputs and on the touch keyboard can be recorded and re-transmitted to the internal synth section and to MIDI gear connected to the 2 MIDI outputs, via the sequencer.

To set up what the touch keyboard and the gear connected to the MIDI inputs will control, go to the sequencer page, select any of the 16 tracks, and select whether you would like to control Fuzion’s synths (Int) or MIDI gear (Ext). Now set the track MIDI channel to the same MIDI channel as the synth/MIDI gear you would like to control. Fuzion’s sequencer will now channelize the touch keyboard and the MIDI input to this.

This procedure are explained further in the ”Sequencer” section of this manual.

The User Interface

Fuzion has a row of 6 pushbuttons on the left side of its screen, and another row on the right. It has 8 knobs for editing parameters and a volume knob below the screen.

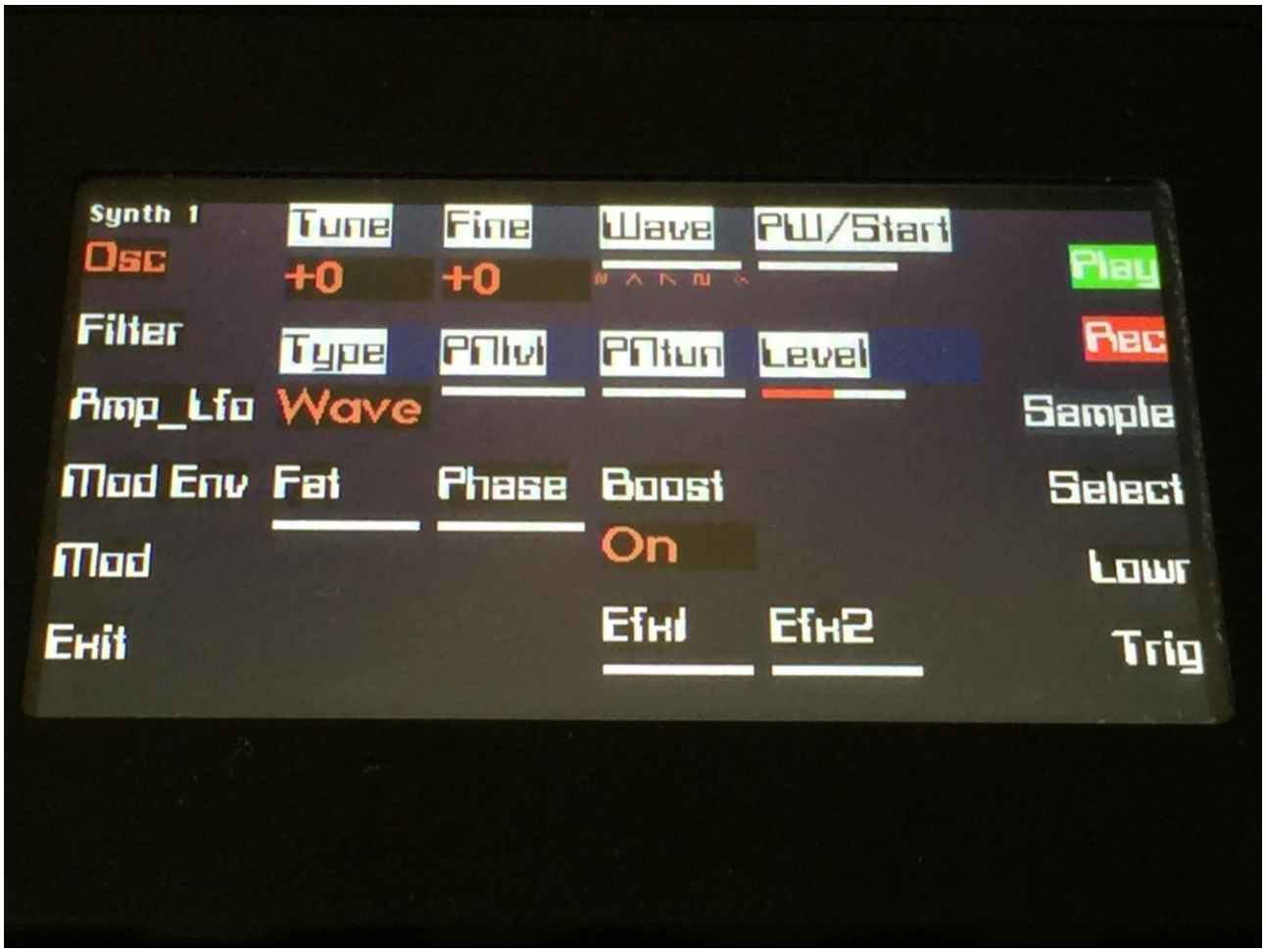
The pushbuttons has different functions for each menu page, but on most pages, you will find **Exit** in the lower left corner, sequencer **Play and Rec** in the upper right corner, and **Lowr and Trig** in the lower right corner.

Exit will exit to the previous page, with the last possible page being the Preset select screen.

Play will start and stop Sequencer playback. When the sequencer is playing back, the green LED near the Play button will light.

Rec will turn Sequencer realtime recording on or off. When realtime recording is activated, the red LED near the Rec button will light.
On pages that has the **Reset** button, which will reset all sequencer tracks to playback position 0.0.0, this will change to **Erase** when the **Rec** button is activated. Pushing **Erase** will erase all events on the currently selected sequencer track.

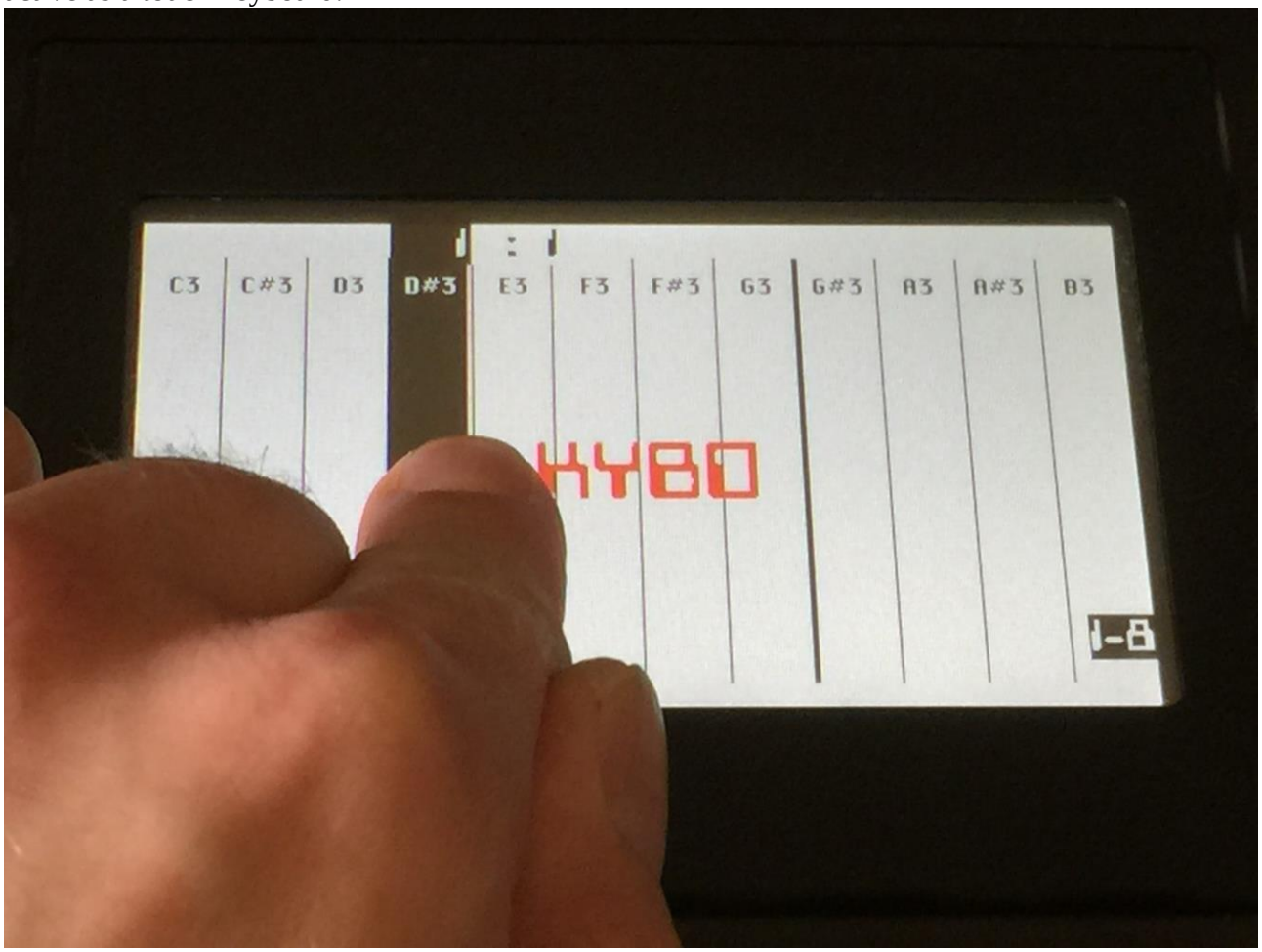
Lowr will give you access to edit the parameters on the lower half of the screen, on pages that has more than 8 parameters.



Every time you enter a new page, the **Lowr** button will be switched off, and the 8 edit pots will edit the upper 8 parameters, on pages with more than 8 parameters.
The names of the parameters selected for editing will be inverted.

Trig will trigger a middle C of the currently selected Sequencer track. If on a Synth page, it will trigger a middle C, of the currently selected synth.

The Touch Keyboard
Fuzion's screen are touch sensitive. Unlike many other devices, it is though not possible to edit anything using the touch screen. All editing is done with knobs. It is though always, on any page, active as a touch keyboard.



Fuzion's touch keyboard has a range of 12 notes. It is possible to adjust what note each "key" should play back, and the notes doesn't have to be in any specific order.

The touch keyboard will always trigger what the selected sequencer track controls. This can both be the internal synth and a connected MIDI device.

The Preset Select Screen

This is the first screen you will see, right after Fuzion's start-up screen. Here you can change preset and jump to Fuzion's edit and settings pages.

To select a preset:
Push any of the two buttons marked "Preset". The upper one will increment the preset number, the lower one will decrement the preset number. Hold any of them down for fast scroll, and hold both down for really fast scroll. 1024 presets can be selected, from A01 to P64.

The yellow LED near the "Enter" button will now start to flash.

Push "Enter" to confirm that you want to switch to the new preset.

If the sequencer is playing back, the Enter LED will now start to flash faster, awaiting track 1 to reach its end. As soon as this happens, Fuzion will switch to the newly selected preset, and the Enter led will stop flashing.

If the sequencer is not playing back, Fuzion will immediately switch to the new preset, when "Enter" is pushed.

When Fuzion is turned off, it will remember which preset was selected, and start up with this, when turned on again.

Right below the preset name, the currently selected track is shown. Right after the track number is shown either a ”_”, which indicates that the selected track has no data recorded to it, or an ”R”, which indicates that the track has data recorded to it.

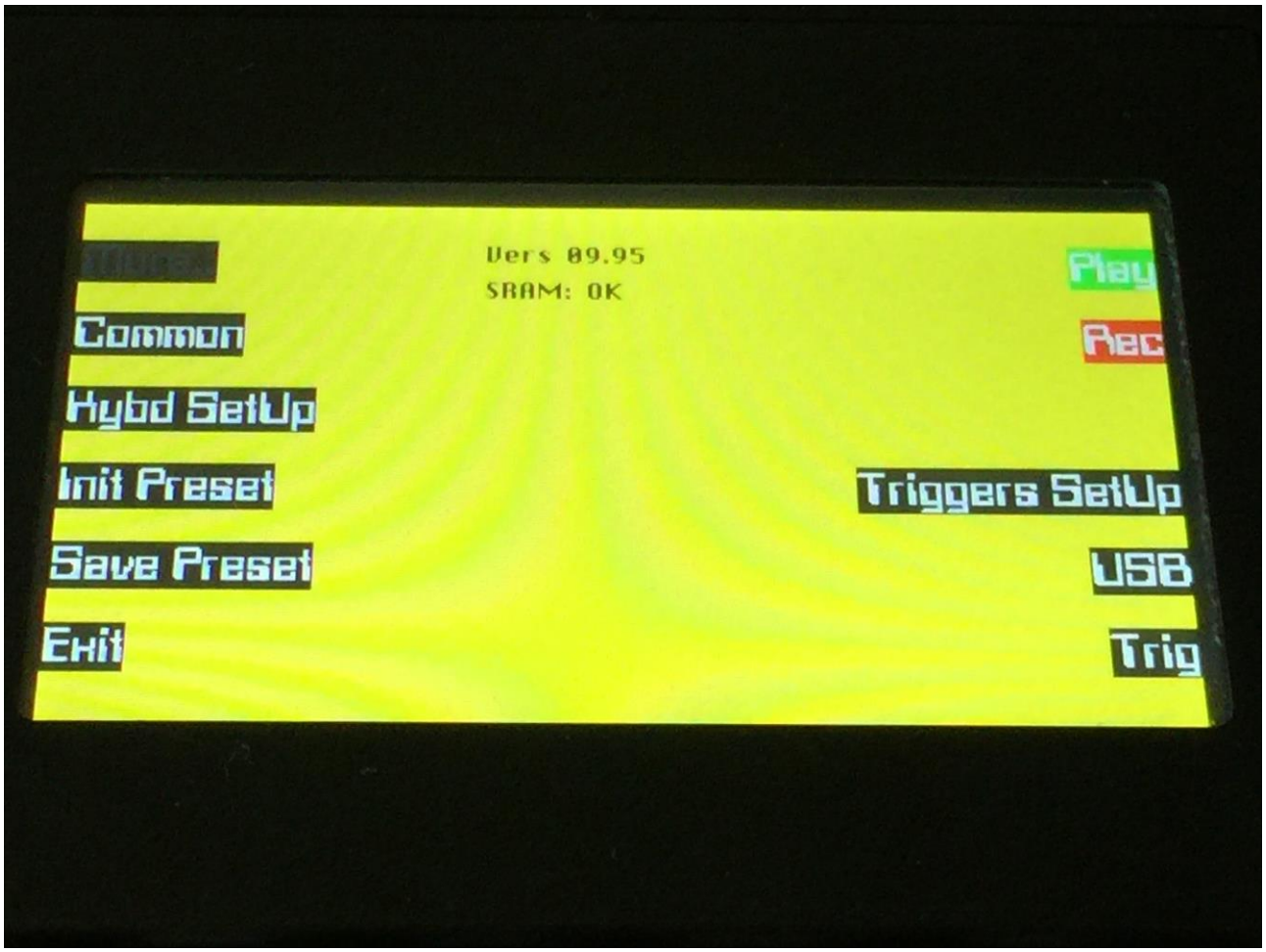
If you hit ”Rec” at this page, realtime events will be recorded to the displayed track.

Right under the track number, is the channel, the selected track is channelized to, displayed.

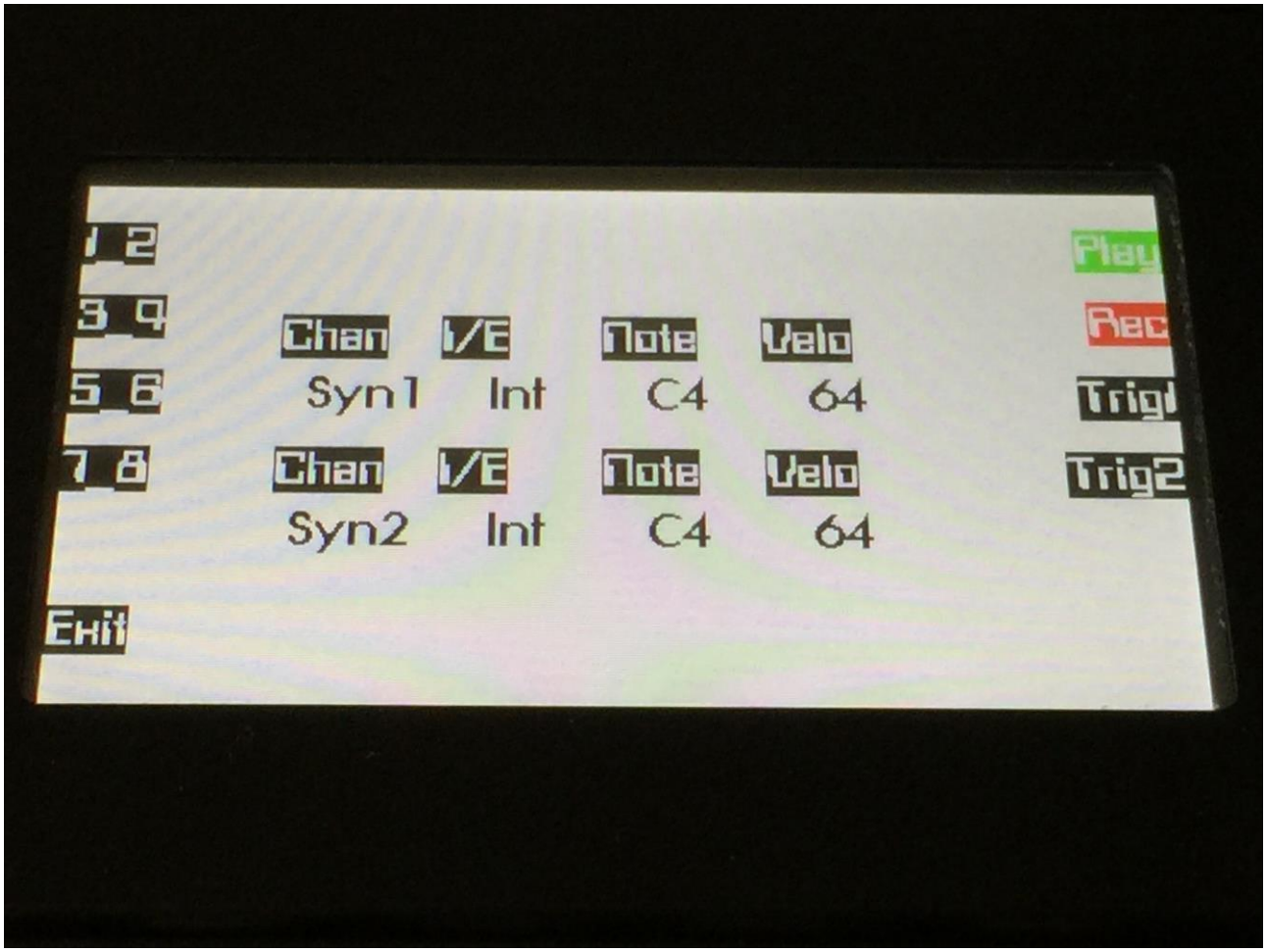
Synth Triggers

On the Preset Select page, it is possible to trigger 8 internal synths or external MIDI devices, using the pushbuttons. To do so, hit the ”Triggers” button.
Now 8 of the pushbuttons will have their names changed to ”Trig1” to ”Trig8”.
Initially these are set up to play back note C4, of internal synth 1 to 8.
To play the synths, simply hit the corresponsive buttons.
To exit from Triggers mode, simply hit the ”Triggers” button again.

To set up what the 8 triggers should trig, first, from the Preset Select page, push the ”More..” button:



Push the ”Triggers Setup” button, to enter the triggers setup page:



On this page, use the buttons ”1_2”, ”3_4”, ”5_6” and ”7_8” to select which 2 triggers, you will adjust.

Use the buttons ”Trig1” and ”Trig2” to audition the triggers.

By edit knob 1 to 8, you can adjust the settings for 2 triggers at a time. The settings are:

I/E: Select whether you would like the trigger to trig an internal synth (Int), or an external MIDI device (Ext).

Chan: Selects the channel that the trigger is sent to. For external devices, MIDI channel and output are selected. The settings goes from 1_1 to 16_1, and from 1_2 to 16_2.
For internal synths, the settings goes from channel 1 to 16, and from synth1 to synth8 (synth direct).

Note: Select the note you would like the trigger to play. The whole 10 octave MIDI note range can be selected. C4 is the middle C.

Velo: Select the velocity value, you would like the trigger to send. Value 1 to 127.

The Sequencer

The sequencer is the main reason why I made Fuzion. I wanted a sequencer with which it was possible to combine long realtime recorded sequences with TR-like/step/pattern sequences, so that is what I have been working towards.

Fuzion's sequencer has 16 tracks. Each of these tracks can have their length set separately, up to 128 bars, have its quatize setting changed on the fly, even while the sequencer is running, and control either Fuzion's internal synths or any MIDI gear.

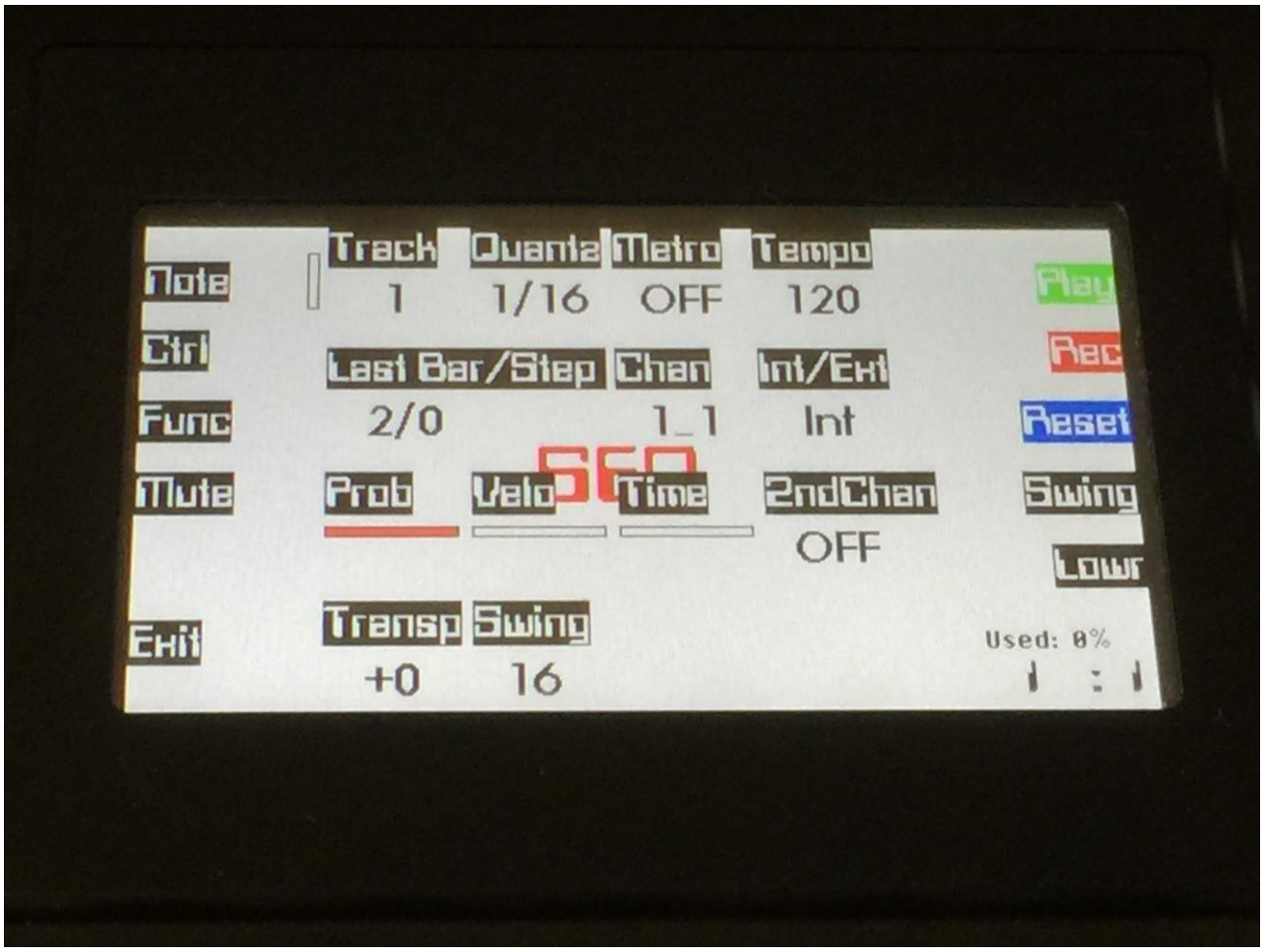
It is possible to realtime record, step pointer record or grid record MIDI data on the tracks. Note, CC, pitchbend, aftertouch and program change data can be recorded.

When you play on a MIDI keyboard connected to any of Fuzion's MIDI inputs, or on Fuzion's touch keyboard, you will play on whatever the selected sequencer track is set up to control. All data is channellized through this. It is possible to set up any track to control Int (Fuzion's synths) or Ext (connected MIDI gear), and it is possible to select any of the 16 MIDI channels and 2 MIDI outputs.

It is also possible to record 8 Audio Tracks, and make Fuzion work like a pattern based harddisk recorder.

Remember to save all edits you do in the sequencer. Else they will be lost when you change preset, or turn Fuzion off. See how to in the "Save Preset" section.

To enter Fuzion's sequencer, from the preset select screen, push the "Sequencer" button. You will now enter the sequencer main page:



On this page you can select any of the 16 tracks, adjust the basic settings for the selected track, and access the sequencer edit functions.

In the upper left corner of the screen, just along with the "Track" parameter, are a small VU-meter, that will show when notes are played back by the selected track.

In the lower right corner, a bar/beat counter are located, which shows what bar/beat is currently being played back. Right above this you can see how many percent of the currently selected presets sequencer memory, that has been used.

The parameters of this page:

The first 8 parameters, that can be changed with the edit buttons, when the yellow LED near the "Lowr" button is unlit:

Track: Selects track 1 to 16. The selected track are the one that is recorded to, and the one that channelizes any incoming MIDI data and the touch keyboard.

Quantz: The quantize setting of the selected track. This can be changed at any time, and will immediately change the note quantization of the track, regardless of if the sequencer is running or not. Settings can be: Off, 1/32, 1/24, 1/16, 1/12, 1/8, 1/6, 1/4.

Metro: Sequencer metronome. Settings are: Off – no metronome, On – metronome is always on, Rec – Metronome are on when realtime recording. The metronome outputs a click on Audio Out 1 and 2, for every beat (1/4 of a bar). For the first beat in a bar, it outputs a click that has a higher frequency, than the next 3 clicks.

Tempo: The sequencer tempo in BPM. From 1 to 300 BPM.

Last Bar/Step: The track length. When a track reaches this bar/step, it will reset, and start over again. Can be adjusted separately for each track. Bar: 1-128, Step: 0-31 in 1/32 note steps.
If both Bar and Step is turned fully down on track 2 to 16 (the default setting), it will read out ”Trk1”. The track will then have the same length as track 1. In that way, you do not have to set the track length for each track, if they have the same length anyway.

Chan: The track MIDI channel. When Int/Ext is set to Ext, the first number is the MIDI channel and the second is the MIDI output number (1 or 2). If Int/Ext is set to Int, it is possible to select channel 1 to 16, and synth 1 to 8 (Synth direct). MIDI channel: 1-16, output: 1 or 2, synth: 1-8.

Int/Ext: Set the track up to control either Fuzion’s internal synth’s (Int), or external MIDI gear (Ext).

The next 8 parameters, that can be changed with the edit buttons, when the yellow LED near the ”Lowr” button is lit:

Prob: The track Note Randomizer probability. Fuzion has a separate Note Randomizer for each track. If probability is turned fully up, all notes of the track will play back. The more you turn this parameter down, the less notes will be played back.

Velo: The track Note Randomizer velocity. The more this is turned up, the more the Note Randomizer will affect the velocity of the notes played back by this track.

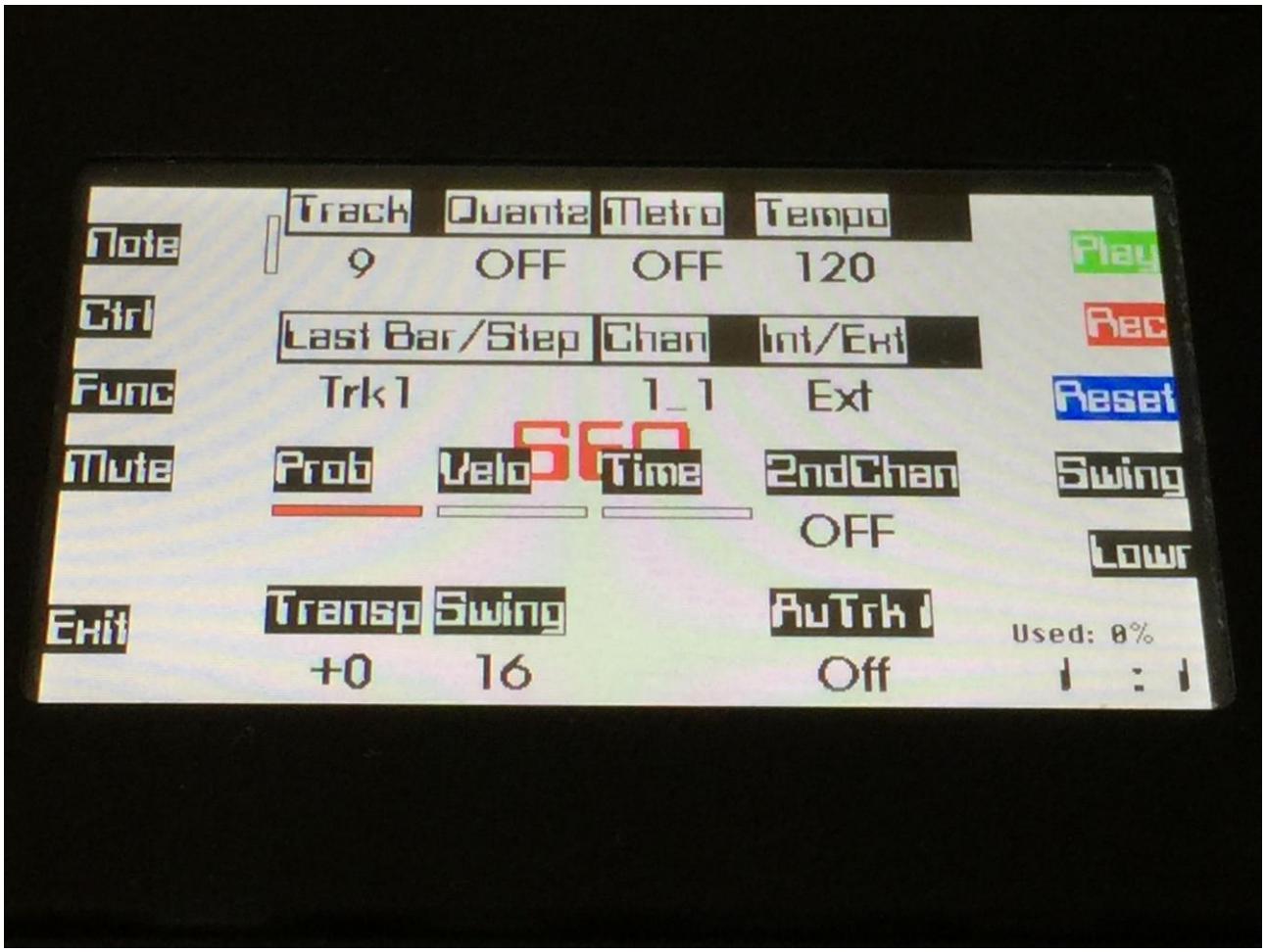
Time: The track Note Randomizer time. When this is turned up, notes played back by this track will be randomly delayed.

2ndChan: The track Note Randomizer second MIDI channel. Settings: Off, MIDI channel 1-16. If this is set to any other setting than Off, notes that are not played back by this track, when the probability parameter has been lowered, will play back on this second MIDI channel. It will trigger the internal synth’s or external MIDI gear, depending on the setting of the Int/Ext parameter.

Transp: Track transpose. This parameter will transpose the whole selected track, by the selected value, in realtime. Settings: -32 to +31 notes.

Swing: Sets the last step for the Global swing sequencer, which will be described later in this manual.

On track 9 to 16, and extra parameter called ”AuTrkx”, where x indicates a number between 1 and 8, will appear in the lower right corner of the screen.



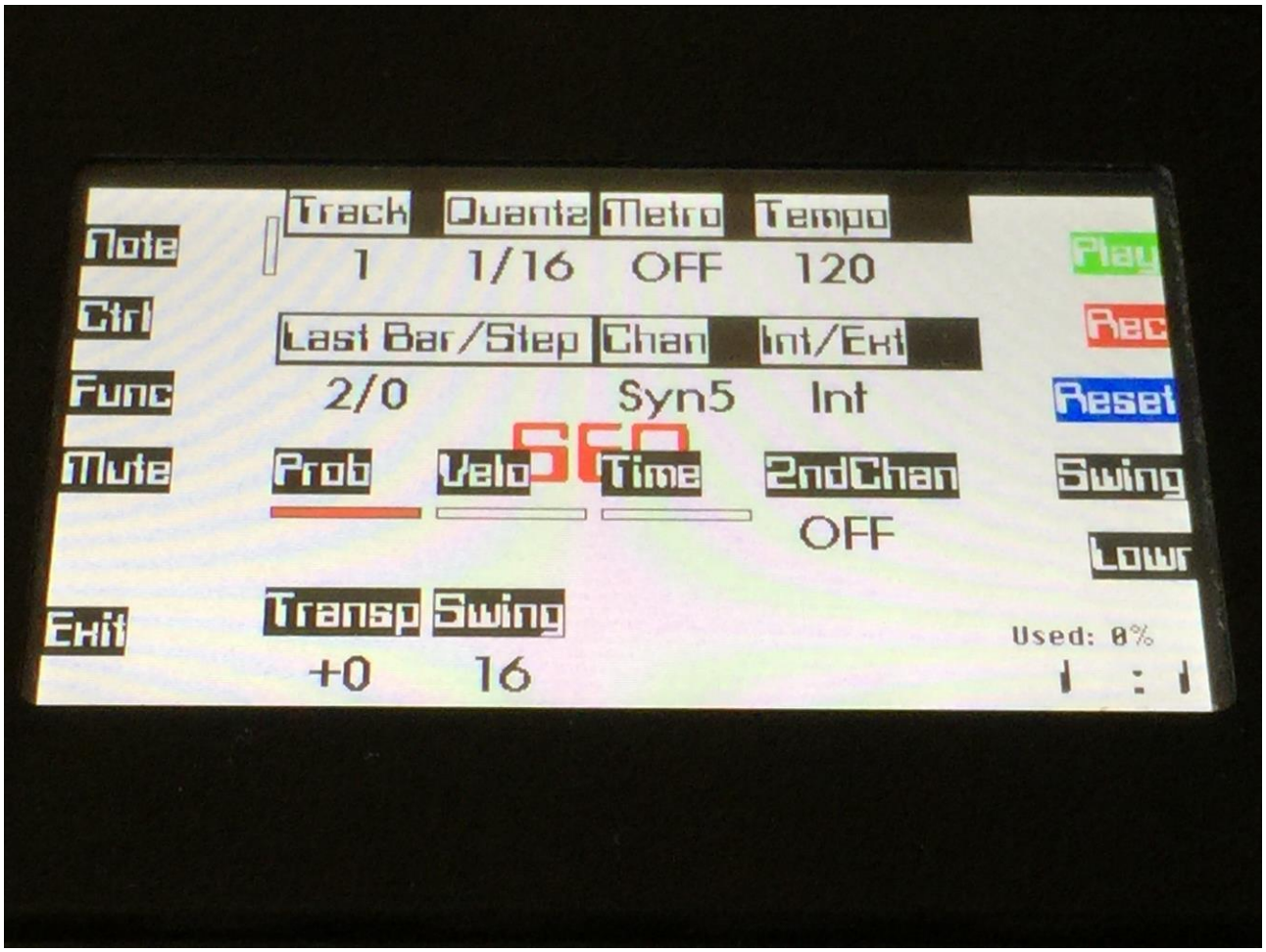
When this parameter is On, the track functions as an ”Audio Track”. When it is Off, it functions as a normal MIDI event track.

Setting up the sequencer to control the internal synth's:

Before I go on, and describes the rest of the sequencer pages, I will here describe the steps for setting up the sequencer to control the internal synths, and external MIDI gear, for those of you who just can't wait.

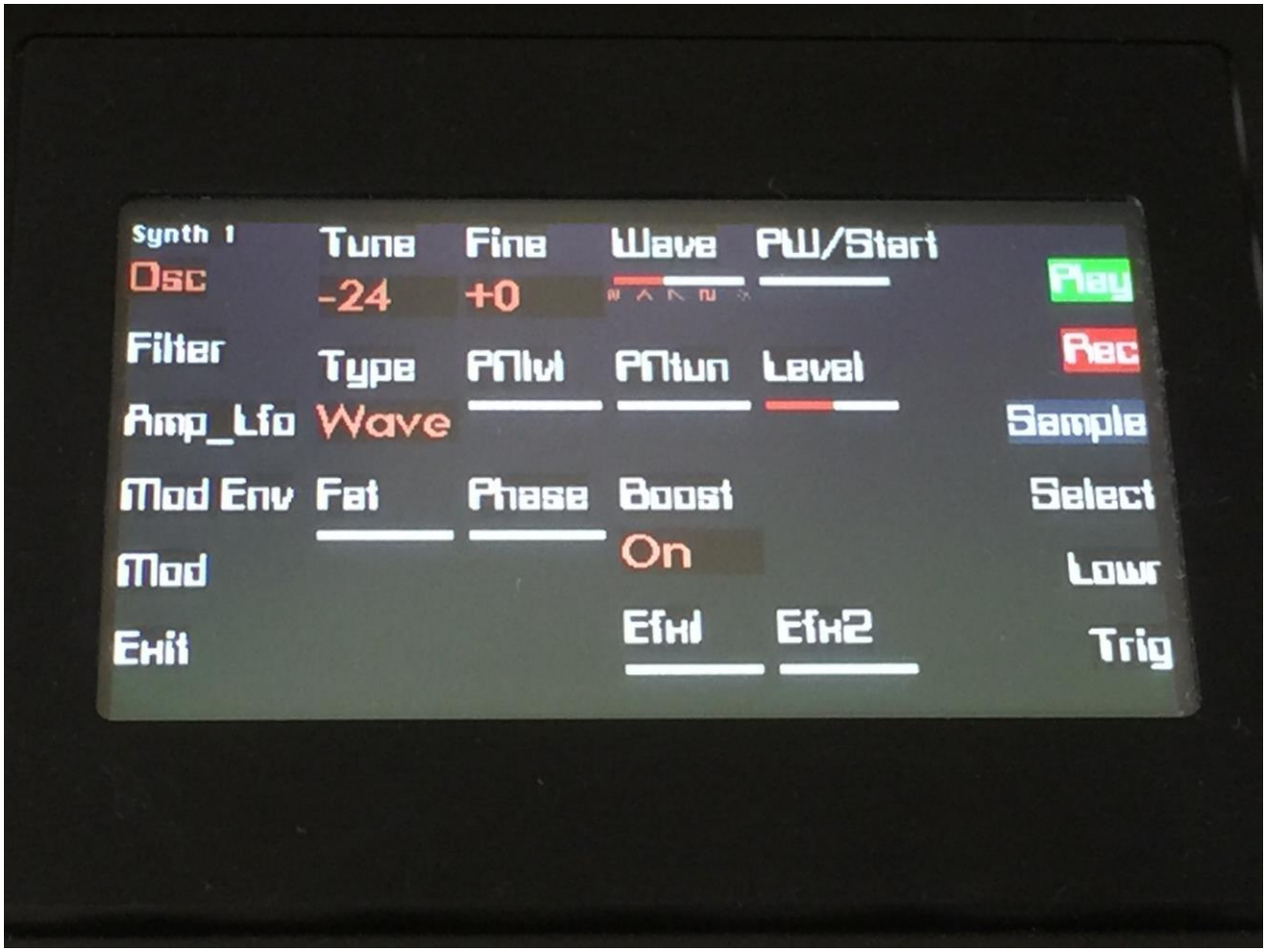
At first, the easy and un-complicated way, which has some limitations. Right after this, the more complicated and less limited way, will be explained.

On the Sequencer Main page simply set a track to "Int" and adjust its channel setting above 1 to 16, to select synth 1 to 8 directly (shown as "Syn1" to "Syn8"). The sequencer track will now control the selected synth, in the full 10 octave MIDI note range, without you having to set up the synths channel and key range.



But like with many other good things, this method has a downside: You can't set up the synths with layers and key splits/overlaps. That is why, I will explain a little more complicated method on the following pages.

From the Preset Select screen, push the ”Synth” button, to enter the synth pages:

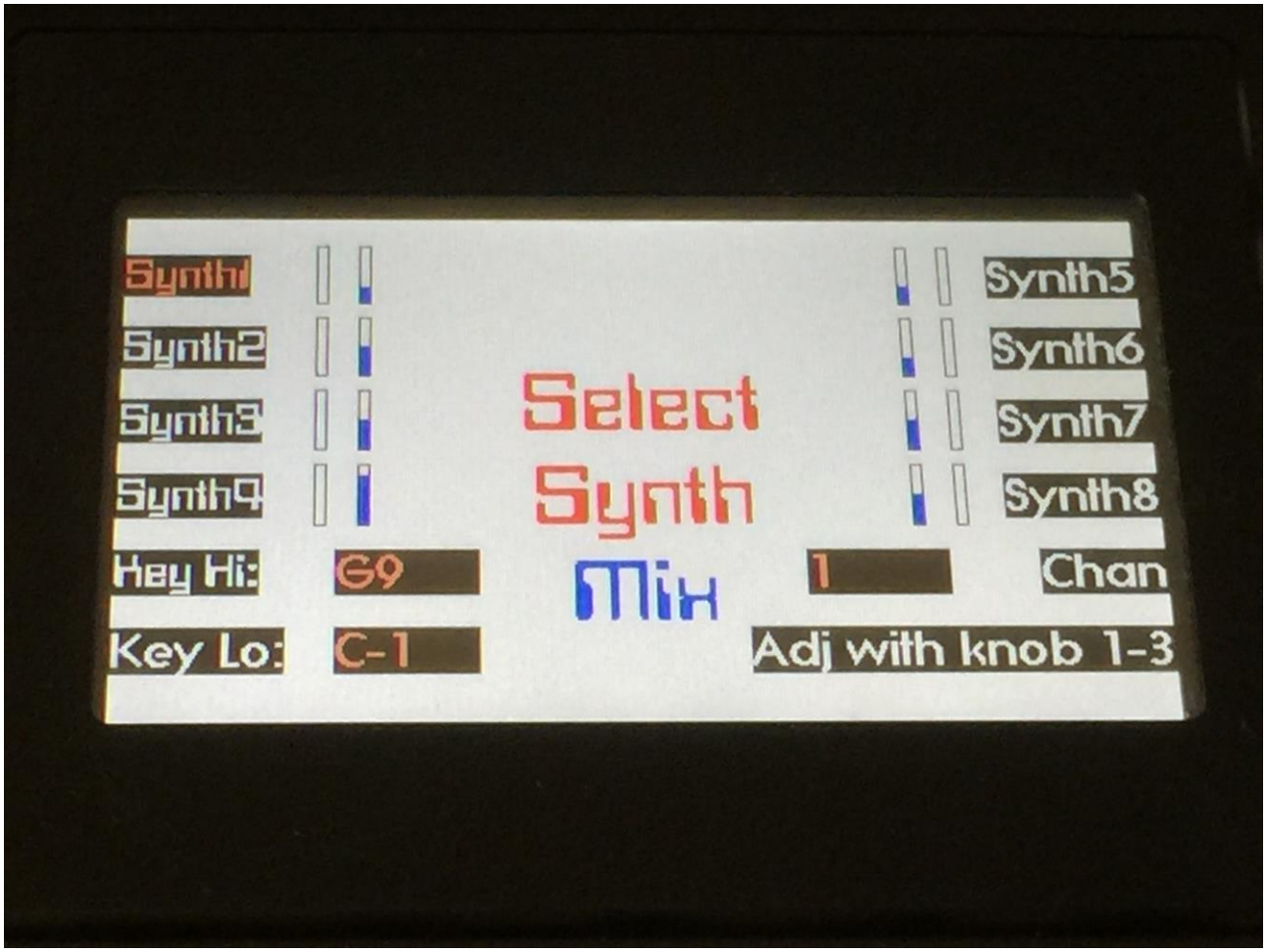


Notice, that in the upper left corner of this page, you can see which of Fuzion’s 8 synth’s, that are selected right now.

By pushing the buttons to the left of the screen, you can select the different modules of the synth, to edit the sound.

You can select which synth to edit, by pushing the ”Select” button on the right side of the screen.

Now push the ”Select” button, to enter the Synth select page:



By pushing any of the 4 upper buttons, on each side of the screen, you can select what synth you would like to edit. When you push one of these, you are immediately taken back to the synth edit pages.

We do however, not want to edit a synth right now. We just wants to set up the MIDI channels and key ranges for the synth’s, so they match something that we can use for recording a sequence.

As default, the synths are set up like this:
-Synth 1 – MIDI channel 1, key range C-1 to G9
-Synth 2 – MIDI channel 2, key range C-1 to G9
-Synth 3 – MIDI channel 3, key range C-1 to G9
-Synth 4 – MIDI channel 4, key range C-1 to G9
-Synth 5 – MIDI channel 5, key range C-1 to G9
-Synth 6 – MIDI channel 6, key range C-1 to G9
-Synth 7 – MIDI channel 7, key range C-1 to G9
-Synth 8 – MIDI channel 8, key range C-1 to G9

To change these settings, you should push the ”Adj with knob 1-3” button, so the red LED near it lights up. Now it is possible to select any of the 8 synths, without jumping back to the synth edit pages.

So now you can select any of the 8 synths, and use edit knob 1 to 3, to adjust the low and the high key of the key range and the MIDI channel.

You can without any problems layer and overlap the synths. Fuzion can handle it!

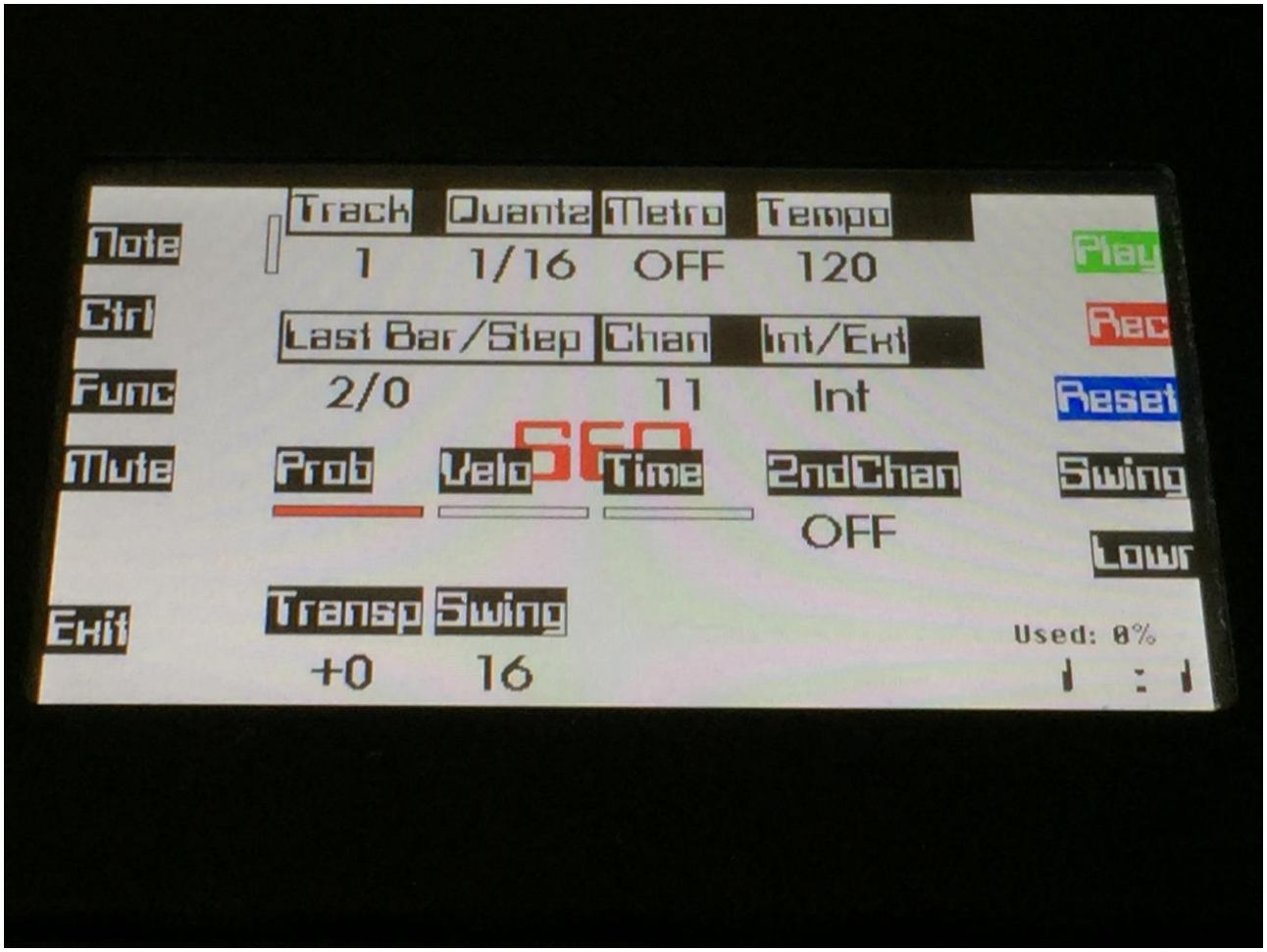
There’s a few other function here:
If you push the ”Chan” button, the selected synth will be set to the same MIDI channel as the selected sequencer track.

It you push the ”Key Hi” or ”Key Lo” buttons, you can select the upper and lower keys of the synths key range, by playing these notes on a connected MIDI keyboard.

To exit from the synth select page, make sure that neither ”Adj with knob 1-3”, ”Key Hi” or ”Key Lo” is selected, and then push any of the 8 synth select buttons, to return to the synth edit pages.

Now push ”Exit”, to return to the Preset Select page.

Now, from the Preset Select page, push the ”Sequencer” button, to enter the sequencer main page:



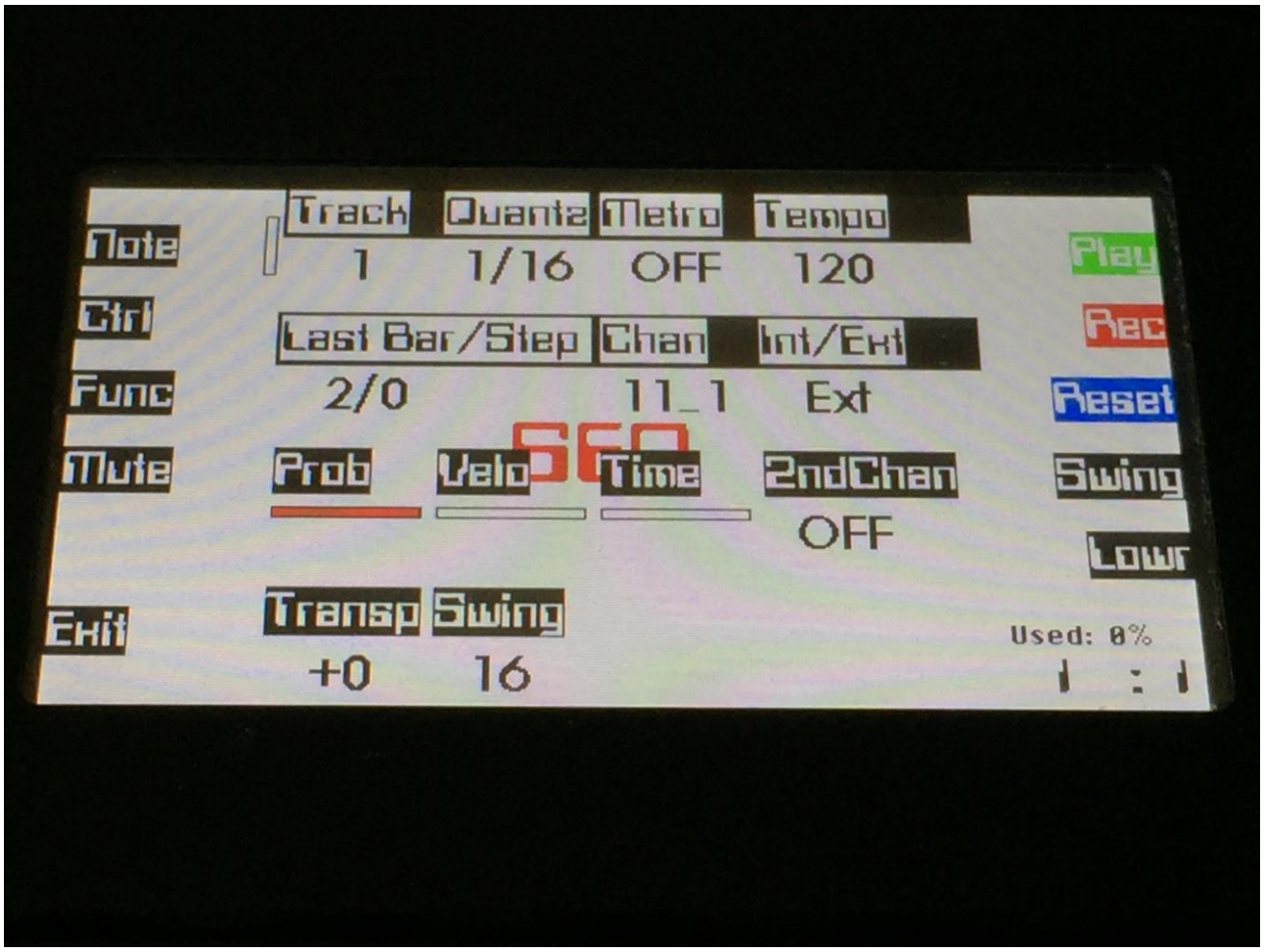
Here, set the ”Int/Ext” parameter to Int, and select the MIDI channel the fits the synth you want to control. You should now be able to play this from a connected MIDI keyboard.

As default, the sequencer tracks are set up like this:
-Track 1: Internal, channel 1.
-Track 2: Internal, channel 2.
-Track 3: Internal, channel 3.
-Track 4: Internal, channel 4.
-Track 5: Internal, channel 5.
-Track 6: Internal, channel 6.
-Track 7: Internal, channel 7.
-Track 8: Internal, channel 8.
-Track 9: External, channel 1.
-Track 10: External, channel 2.
-Track 11: External, channel 3.
-Track 12: External, channel 4.
-Track 13: External, channel 5.
-Track 14: External, channel 6.
-Track 15: External, channel 7.

-Track 16: External, channel 8.

Setting up the sequencer to control external MIDI gear:

From the Preset Select screen, push the ”Sequencer” button, to enter the sequencer main screen:



Set the ”Int/Ext” parameter to Ext, and adjust the MIDI channel to match the MIDI device you would like to control, and the MIDI output it is connected to.

Realtime recording

Now you are ready to record something. Only realtime recording will be explained in this section. Step pointer recording and grid recording will be explained later in the ”Note Edit” section.

First you should adjust the length of the track. This setting can be changed at any time, so it is not important to get it right. Just set it where you think it should be. If you wants all tracks to have the same length, you should only adjust the length of track 1.

Switch the metronome to on or rec, if you would like this to sound.

Adjust the tempo. This you can also do at any time, even while recording.

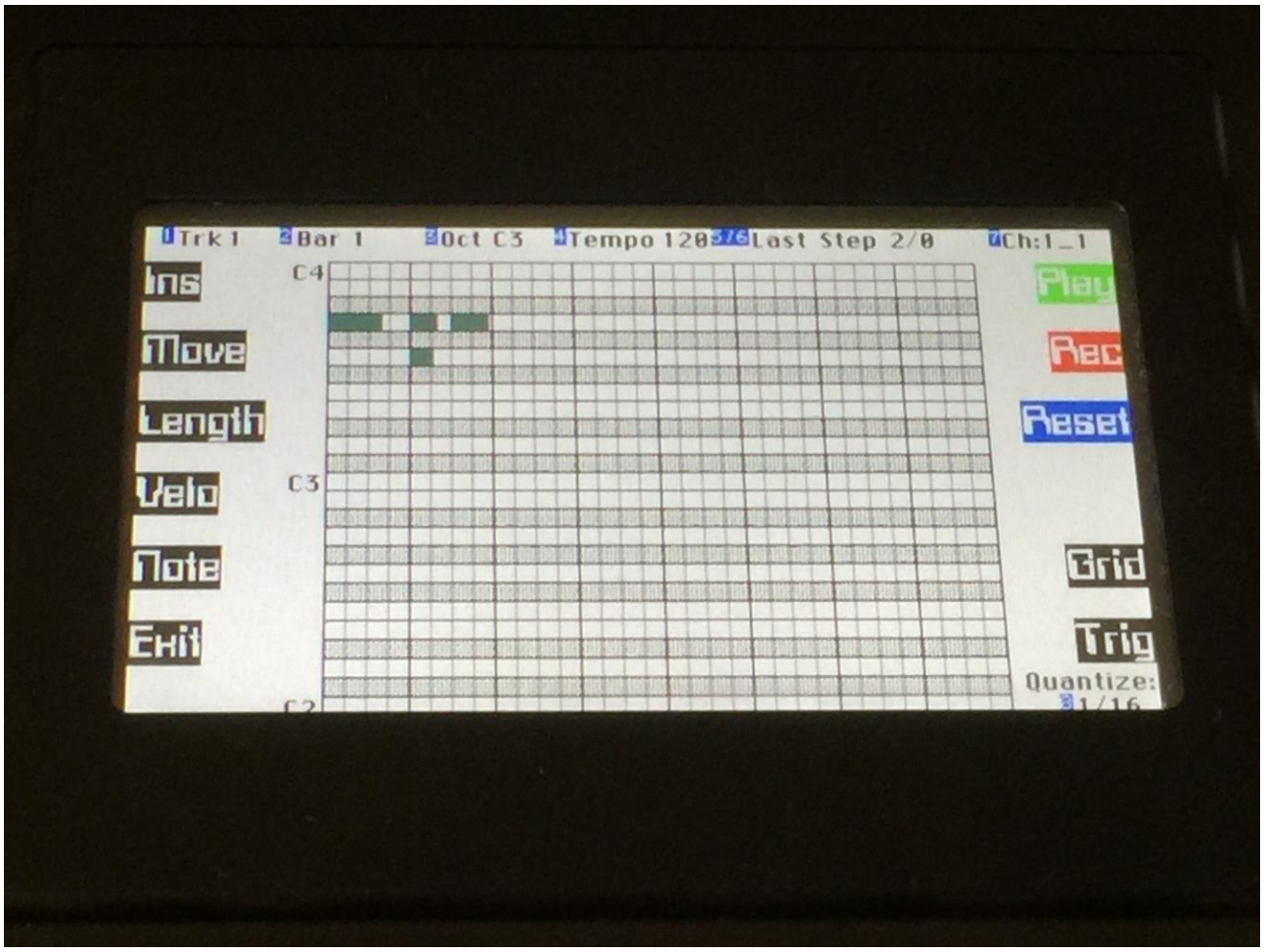
Hit the Play button and then the Rec button, or hit the Rec button first, and then the Play button. It will start a 2 bar count-in, if you push Rec before play.

Now, please play the connected keyboard and controllers, or the touch keyboard, and all your actions will be recorded.

When you are finished, push Rec again, so the red Rec LED does not light up, and remember to save your work (explained later in this manual).

Note Edit

From the sequencer main screen, push the ”Note” button, to enter the note edit page:



On this page you can view, grid record and edit note events, and step pointer record any MIDI events.

The first note edit page you will enter, shows the note grid. All recorded note events will be shown at this as green bars.

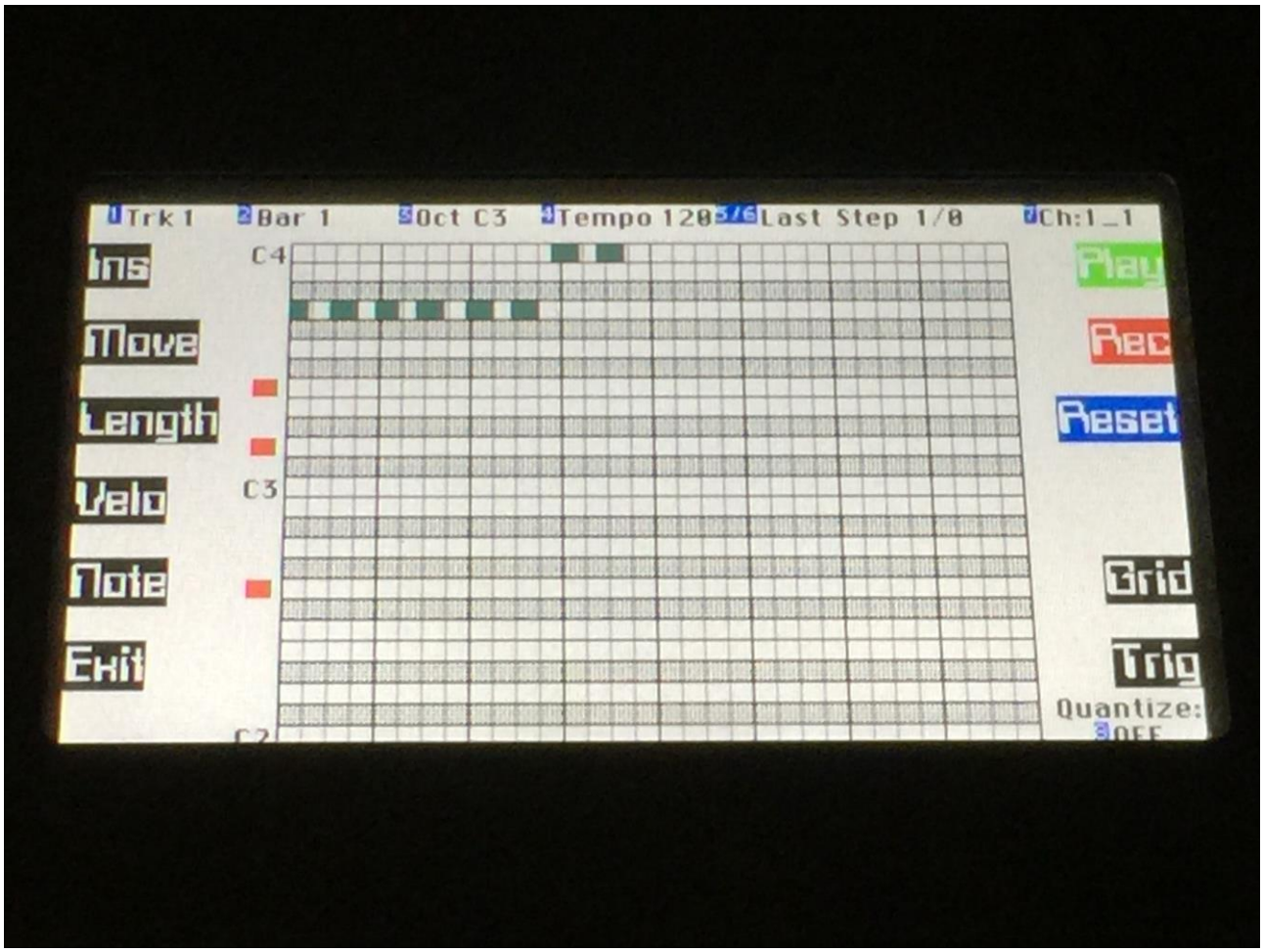
As default the selected track’s bar 1 and 2, note C2 to C4 are shown. 2 bars and 2 octaves are shown at a time.To change the view use:

-Edit knob 1 for changing the track.
-Edit knob 2 for changing the bar.
-Edit knob 3 for changing the middle note.

Other settings that can be done on this page:

-Edit knob 4 : Sequencer tempo
-Edit knob 5 : Track last bar
-Edit knob 6 : Track last step
-Edit knob 7 : MIDI channel
-Edit knob 8 : Track quantize setting

If you play back notes on a connected MIDI keyboard, that are inside the selected range, these will be shown as squares to the left of the note grid:



When the sequencer is playing back, a pointer will roll over the note grid, showing the position that is played back.

Inputting note events

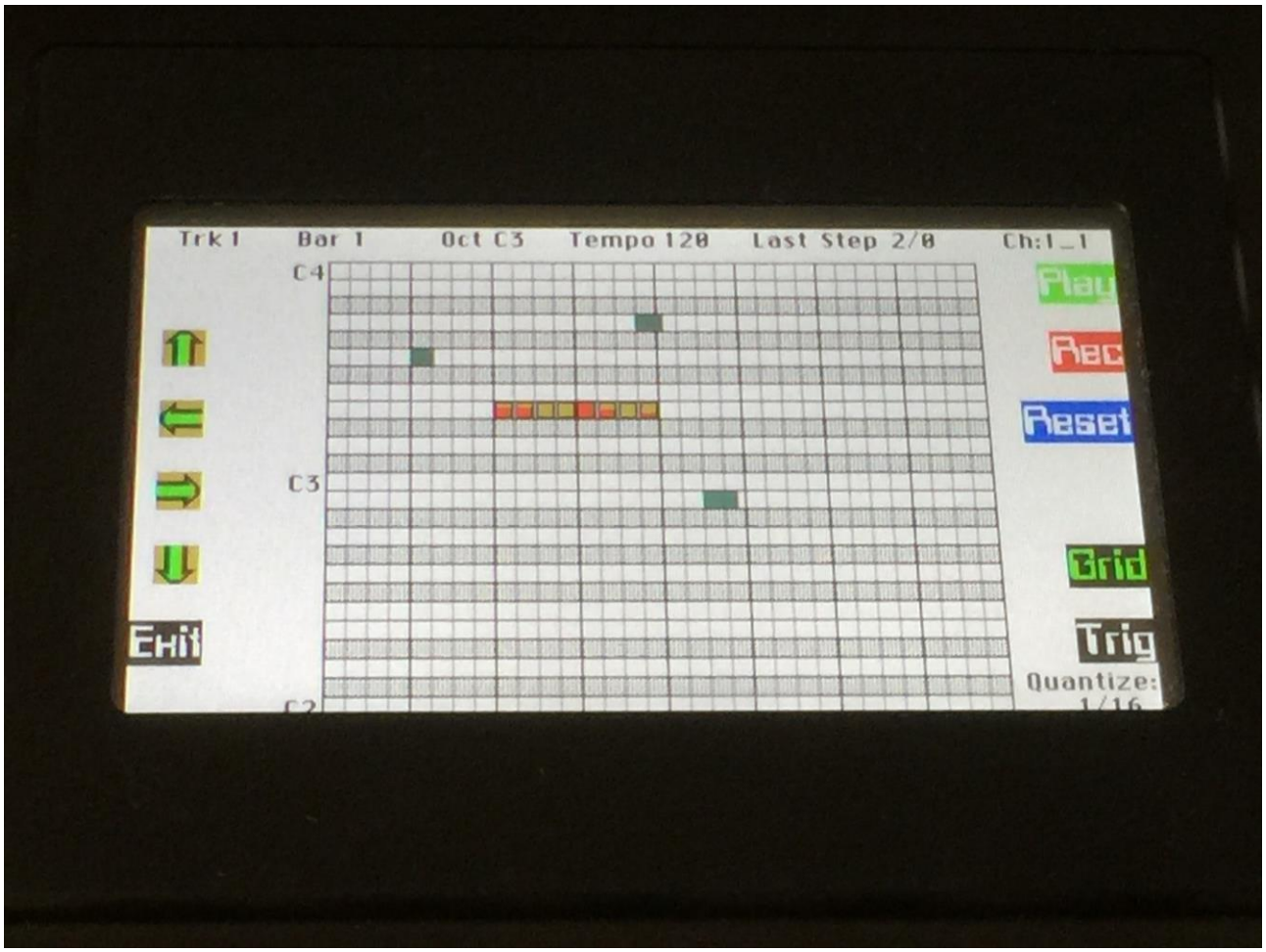
There are 3 ways of inputting new note events to Fuzion's sequencer. Realtime recording as explained earlier in this manual, grid recording and step pointer recording. First I will have a look at:

Grid recording

Before you can start to grid record, you must turn track quantize on. If you attempt to switch on grid recording, when track quantize is off, Fuzion will tell you to turn quantize on first.

When grid recording, quantize selects the resolution and the length, of the notes to be recorded.

On the note grid page, push the "Grid" button:



8 yellow squares will now appear inside the note grid. These squares indicates where in the note grid, notes will be added, if you turn edit knob 1 to 8. By turning any of the edit knobs, you turn a note on at this position, and adjusts its velocity value. The velocity value is visualized by a red colour. If you want to switch the note off again, simply turn its velocity value down to zero.

By using the 4 arrows that appears in the left of the display, you can navigate the 8 squares around in the note grid, to select which notes you would like to input.

If the grid squares are placed at a position, where note events already exists, their velocity value will be shown with red colour, inside the squares. It is then possible to edit the velocity value of the note, or remove it, by turning its velocity value down to zero.

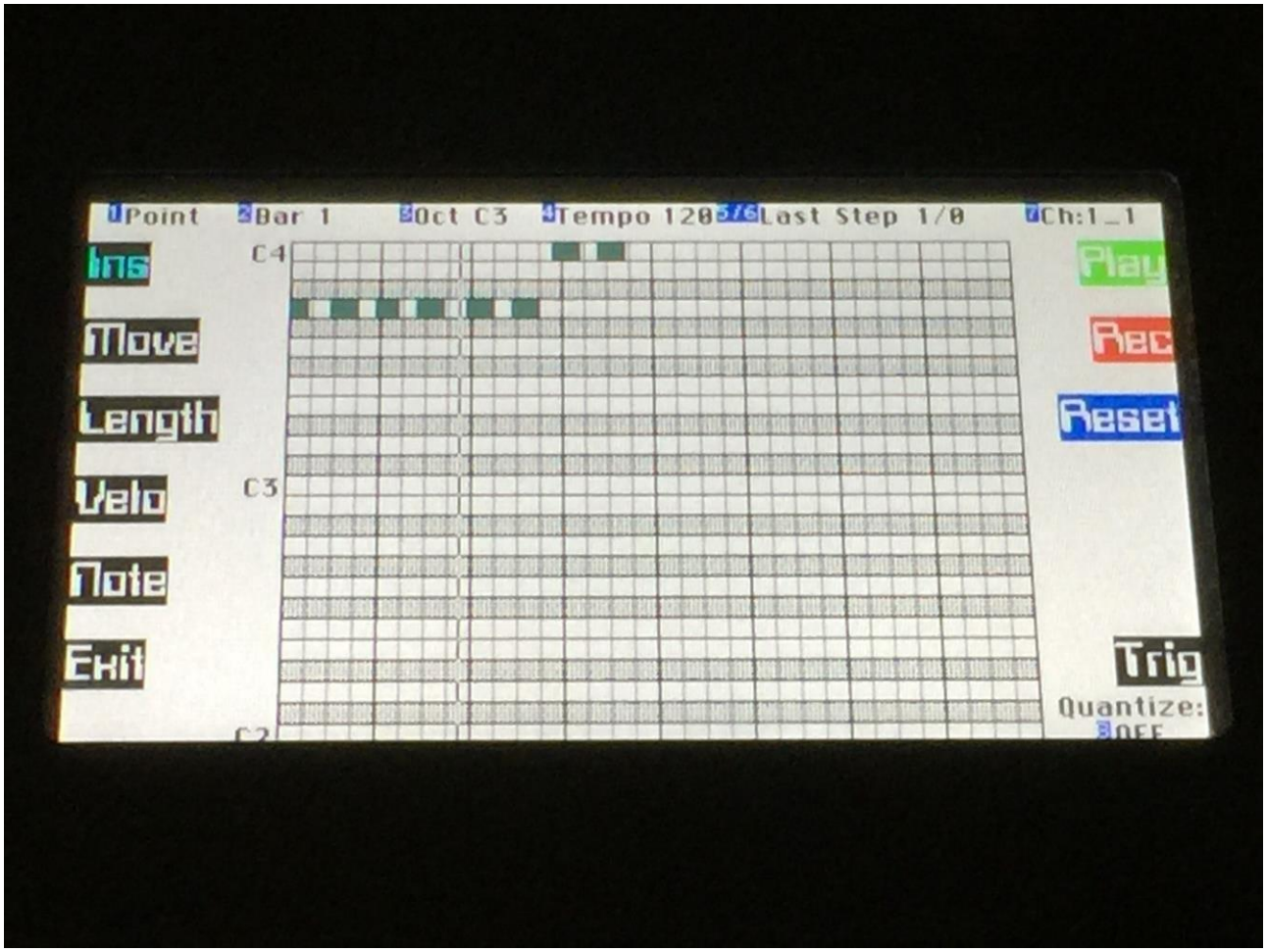
For exitting grid record, simply hit the ”Grid” button again, so its LED goes off.

It does not matter if the sequencer is playing back or is stopped, when you performs grid recording, and when you turn it on and off.

Step pointer recording

This recording mode lets you input MIDI events (not only note events) to the track, at a specific point of time.

On the note grid page push the ”Ins” button:



A pointer now appears in the note grid. You can now use edit knob 1, to move this pointer around in the note grid. The step resolution, of which the pointer will jump, is determined by the quantize setting. Any MIDI events that are received from the MIDI inputs, will be placed at the position of the pointer.

To exit step pointer recording, simply hit the ”Ins” button again, so its LED goes off.

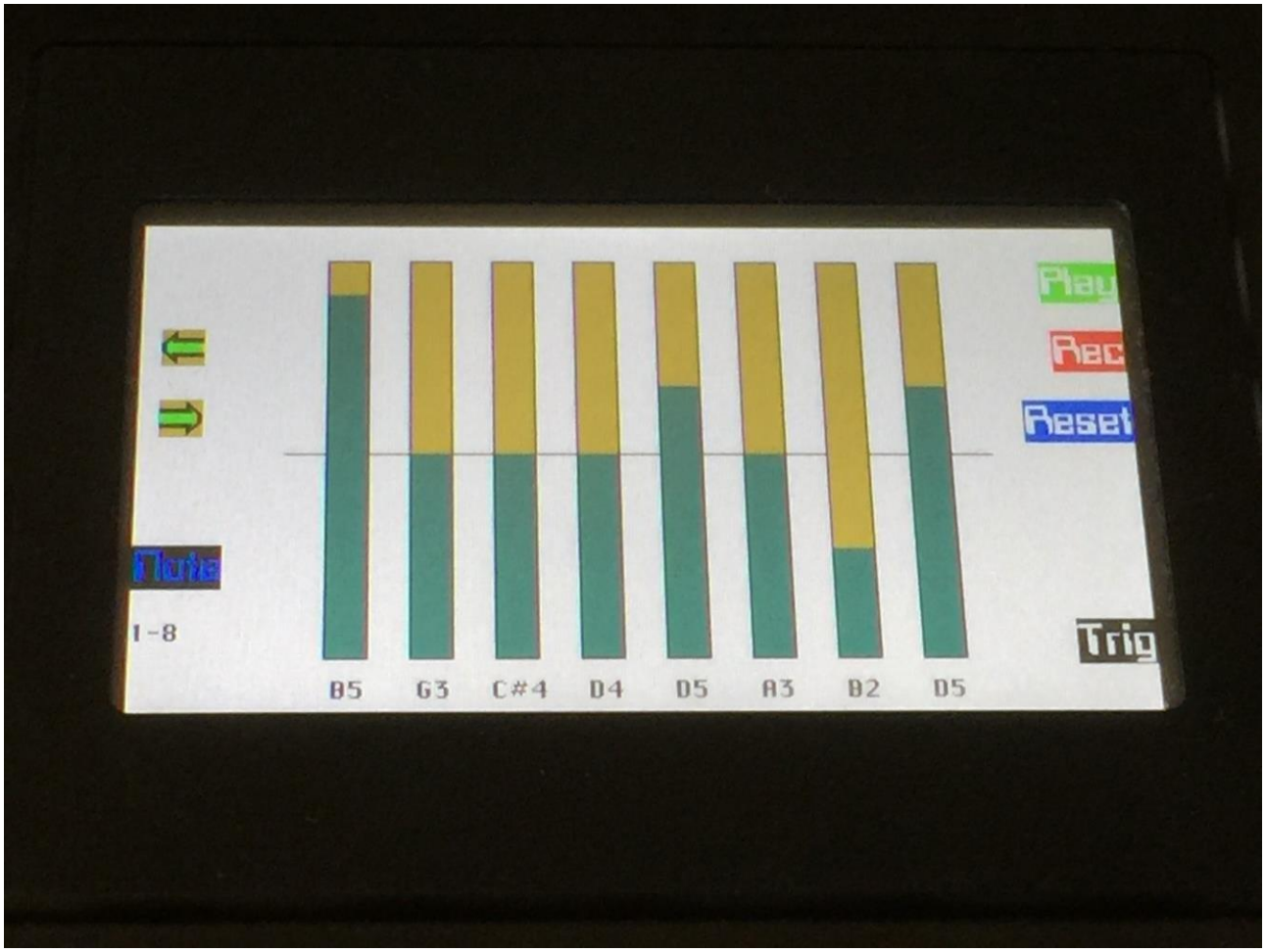
Edit note events

I did many experiments, trying to find a way to edit the note events in the note grid, that would work great on the Fuzion hardware. I didn't find any. Marking 8 notes in the note grid at a time for editing, and using arrows to select these, was a confusing experience, especially if the notes were close to each other. Then you would never know what note you would edit, when turning a knob. So i came to the conclusion, the editing notes directly in a note grid (or piano roll), only works properly on mouse based systems like computers, not on a hardware sequencer with knobs.

So I had to find another way…

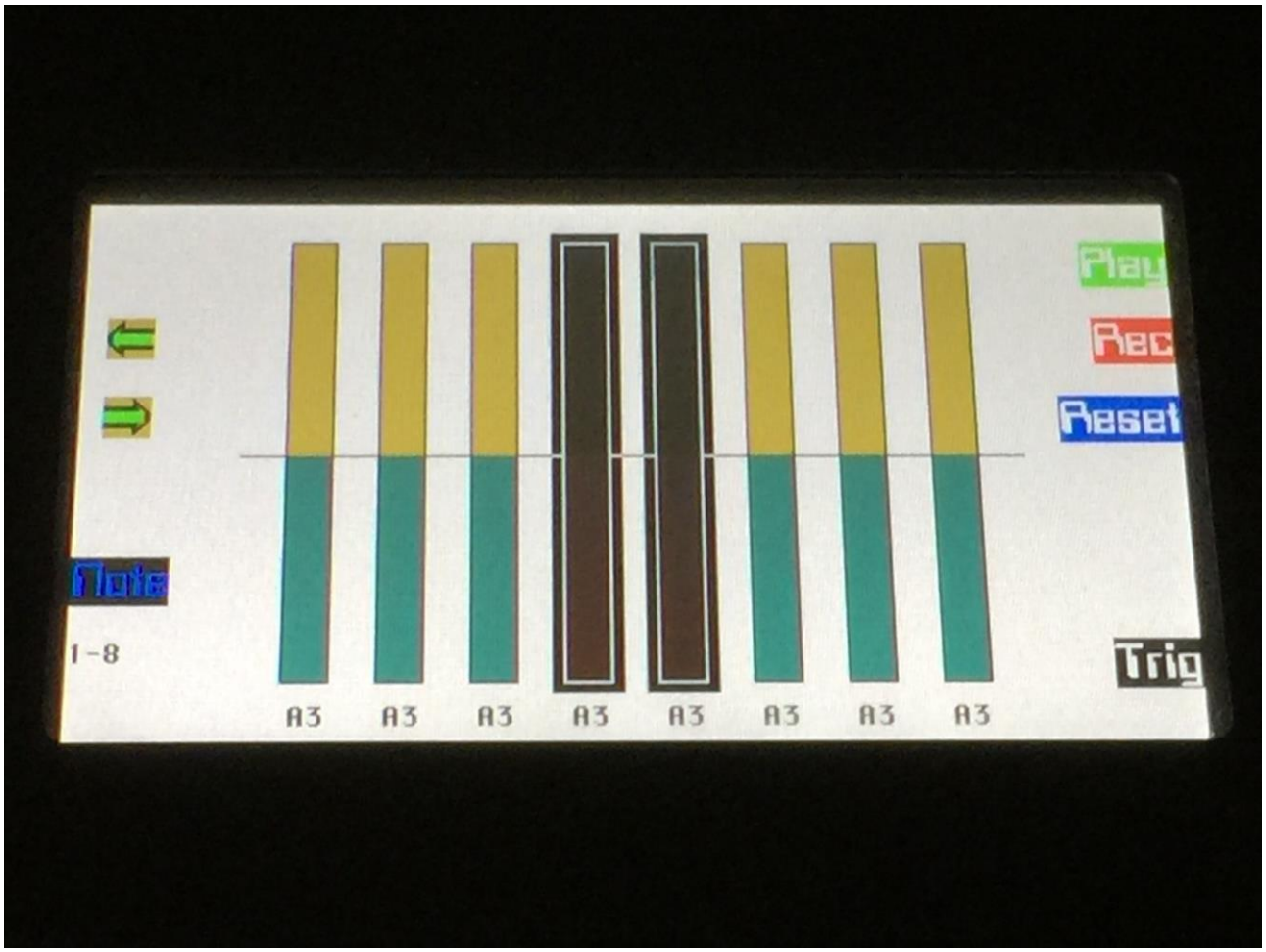
I had been thinking, that it would be really great, if it somehow could be possible to integrate something that reminded of analogue style sequencing, into this design. And there was the answer!

From the note grid page push "Note", and you will enter this screen, where it is possible, in some kind of analog style, to view and edit the note values, of each note event in the track:



You can now use the 2 arrows to select which notes you would like to edit, and use the 8 edit knobs to change the values. The note values are shown both graphically by the bars, and in text below the bars. The middle value will always be the original note, at the time it was selected.

When a note is being played back by the sequencer, Fuzion will indicate this, by inverting the colours for this/these note(s):



Only notes inside the 2 bars, that are selected on the note grid page, can be selected on the note edit pages.

To exit from note value edit, simply hit the ”Note” button again.

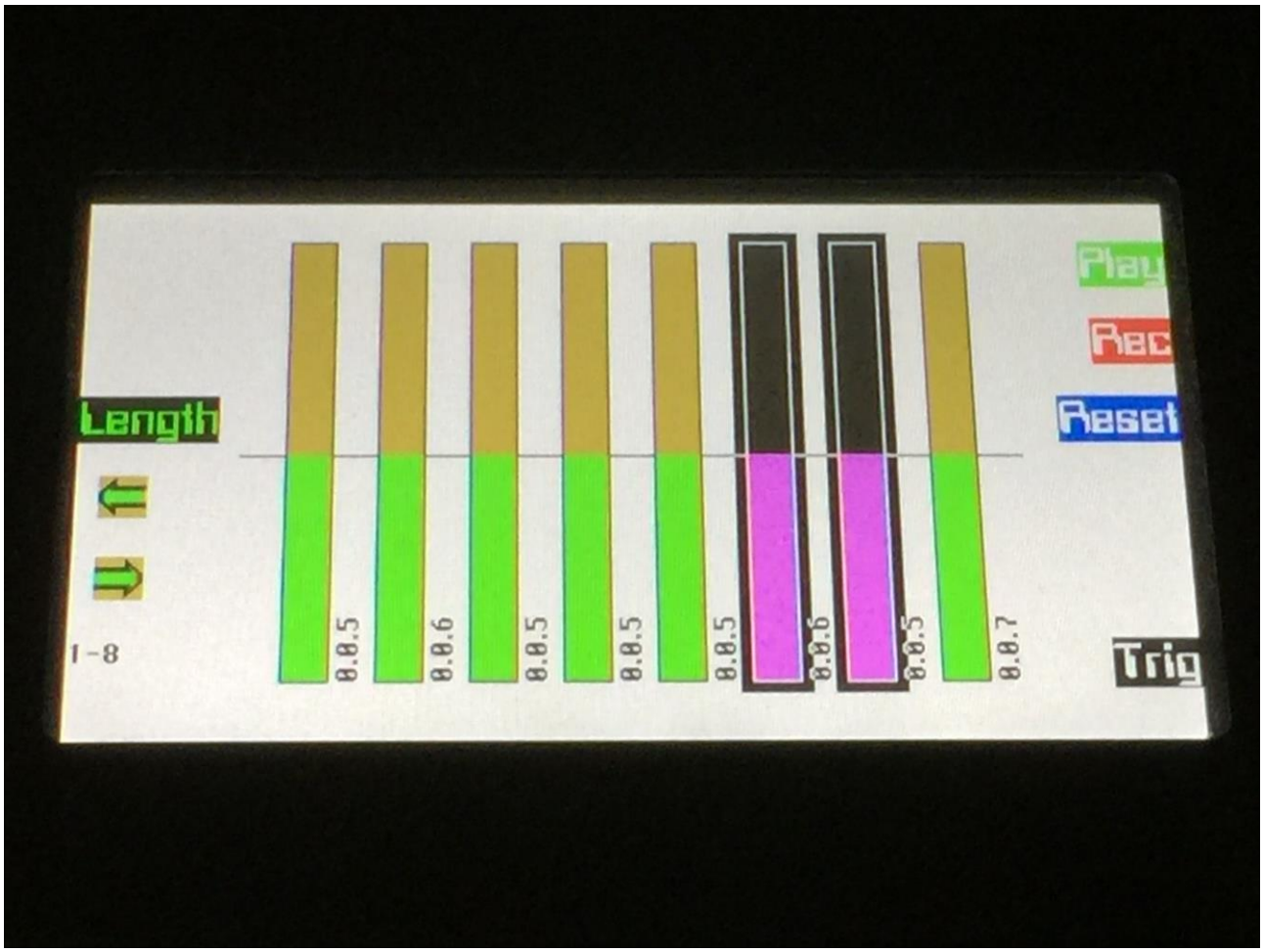
The same system is used for editing velocity, note length and note position. Here are a short description of these pages:

Velocity edit

Enter and exit this, using the ”Velo” button. If a note velocity value are adjusted down to zero, this note will be erased.

Note length edit

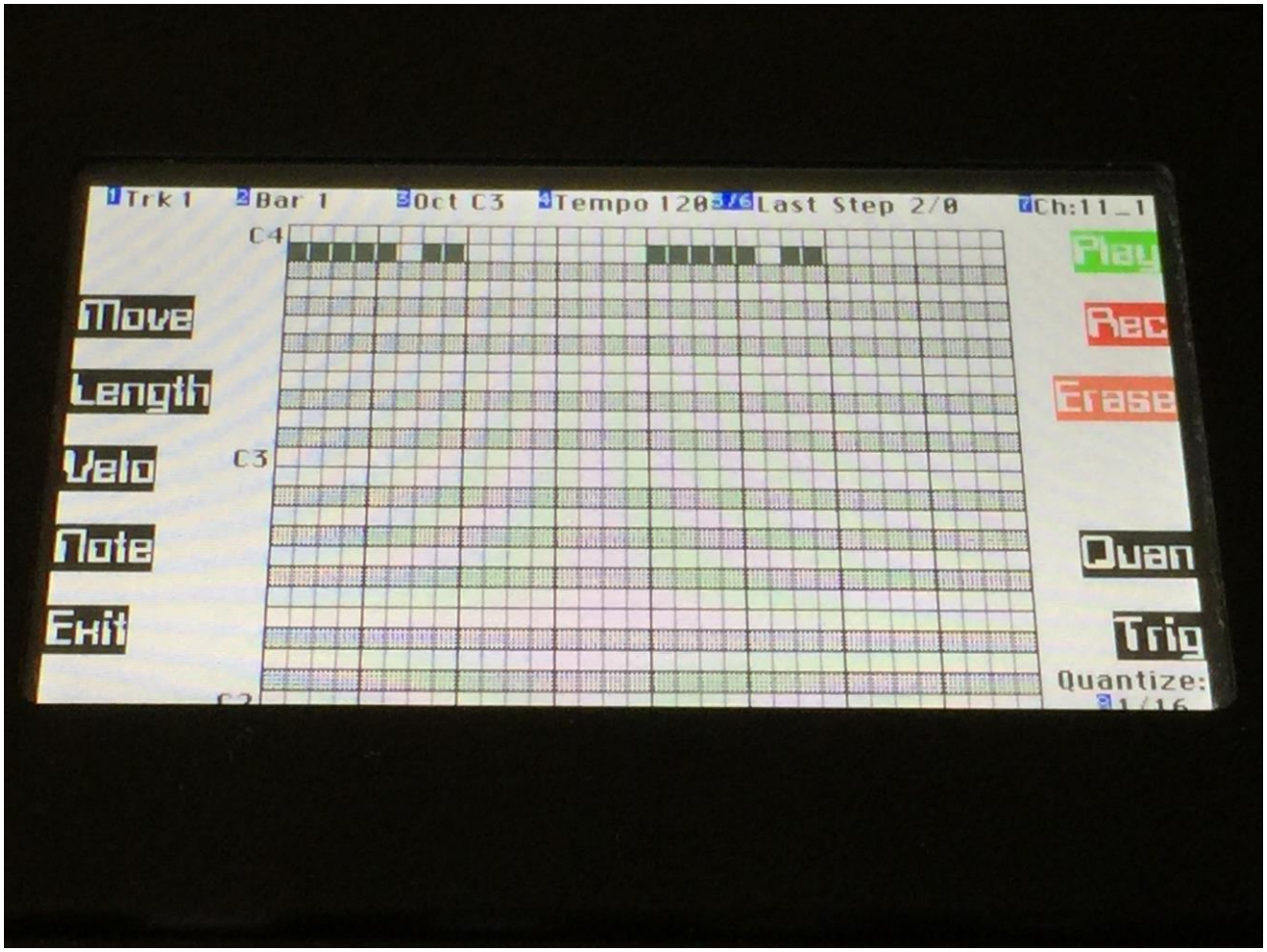
Enter and exit this, using the ”Length” button. The minimum adjustable length for each note, are half of the original length. The maximum adjustable length for each note, are double the original length. On this page, the length are shown in bars/beats/tics, along with the bar.



Note position edit

Enter and exit this, using the ”Pos” button. When adjusting the position of a note event, it is moved in 1/32 steps, or in steps selected by quantize. On this page, the note event position are shown in bars/beats/tics, along with the bar.

Erasing a sequencer track



On all pages, that has the ”Reset” button, this is changed to ”Erase”, when the Rec button is activated.

Pushing the ”Erase” button, will erase the entire content of the currently selected sequencer track.

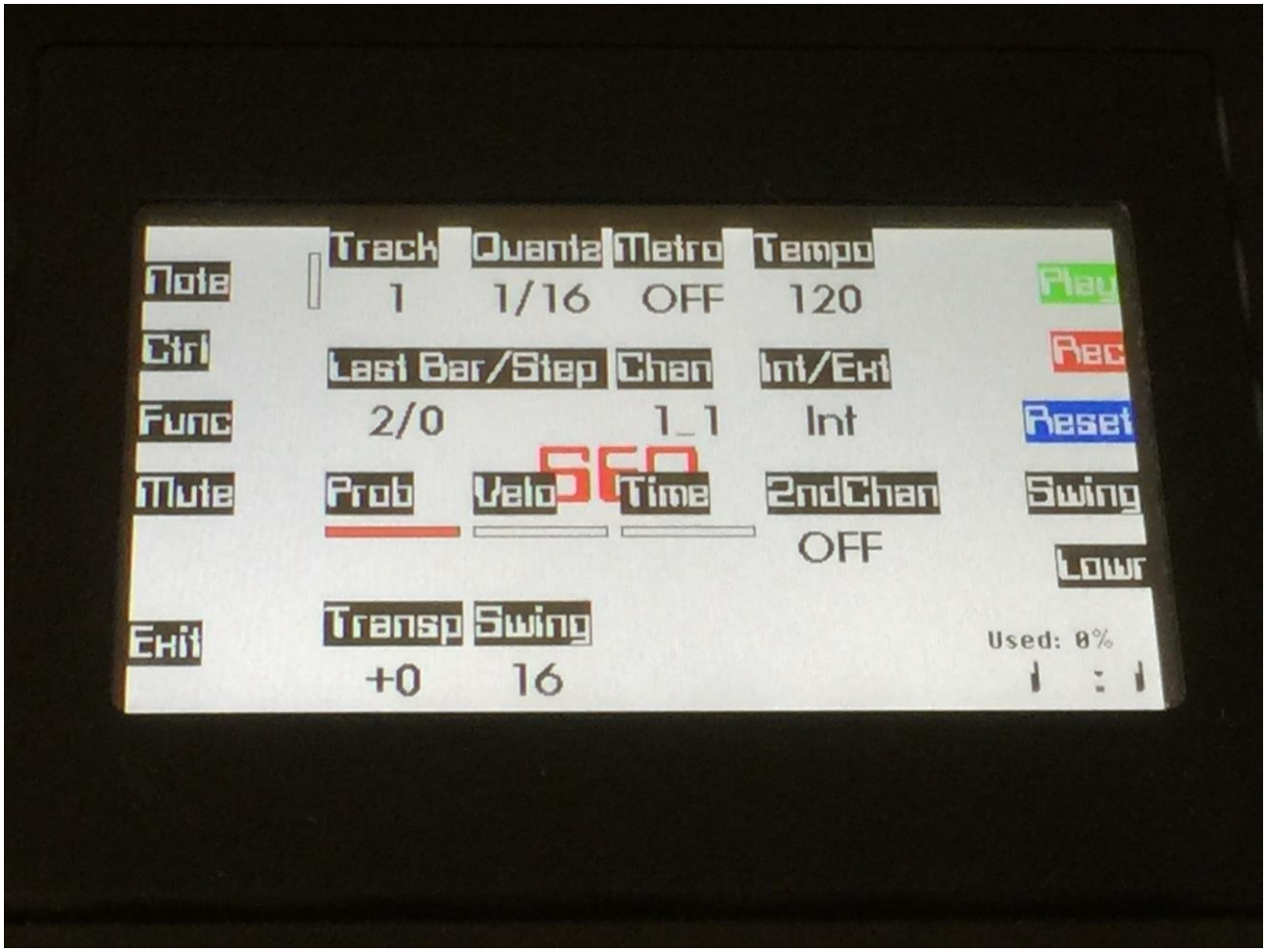
Making Quantize permanent

On the Note Grid page, ”Grid” will change to ”Quan”, when the Rec button is activated.

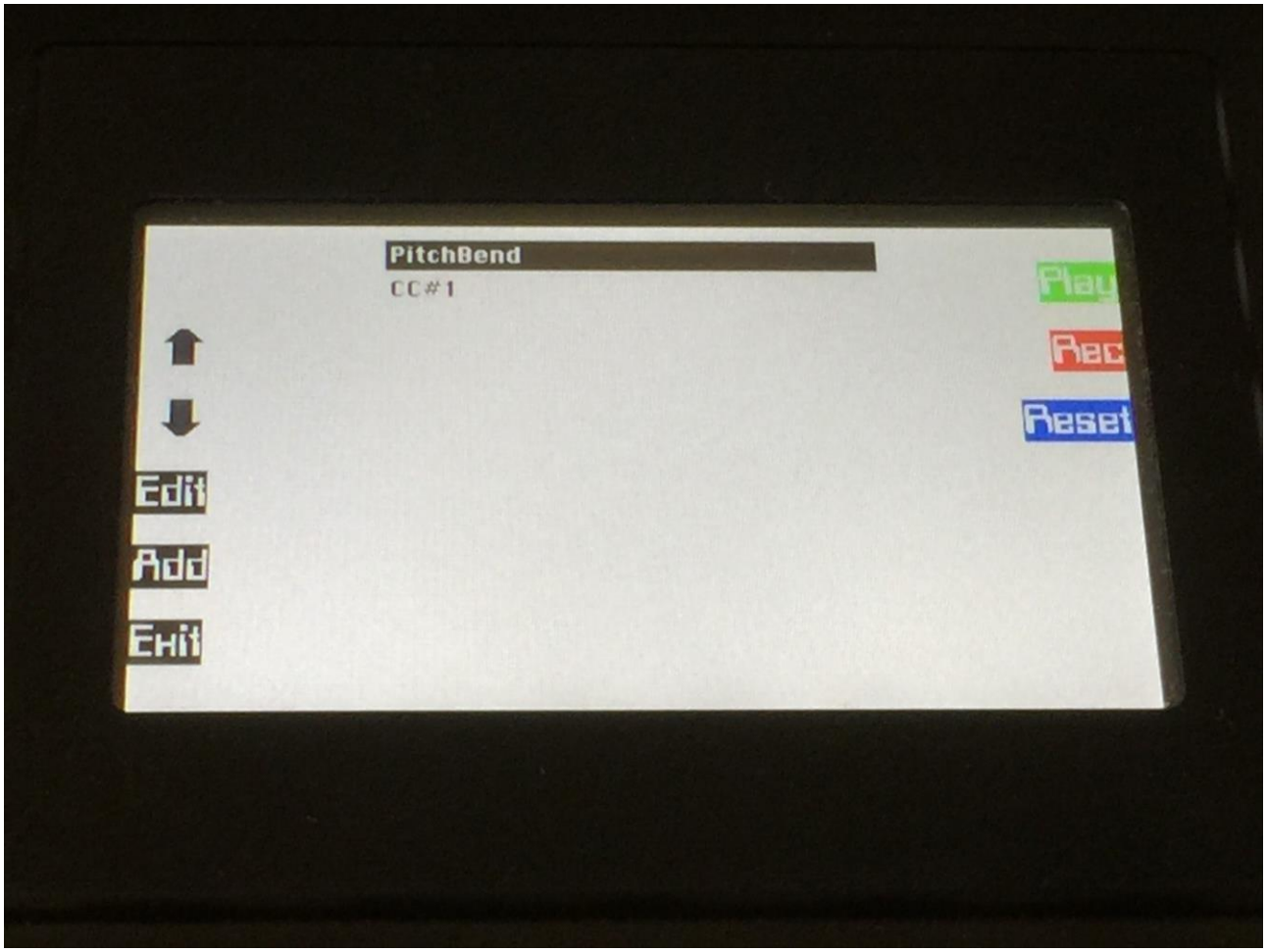
Pushing the ”Quan” button, will re-save all note events on the currently selected track, positioned using the currently selected Quantize setting.

CC’s, Pitch Bend and aftertouch edit

From the sequencer main page:

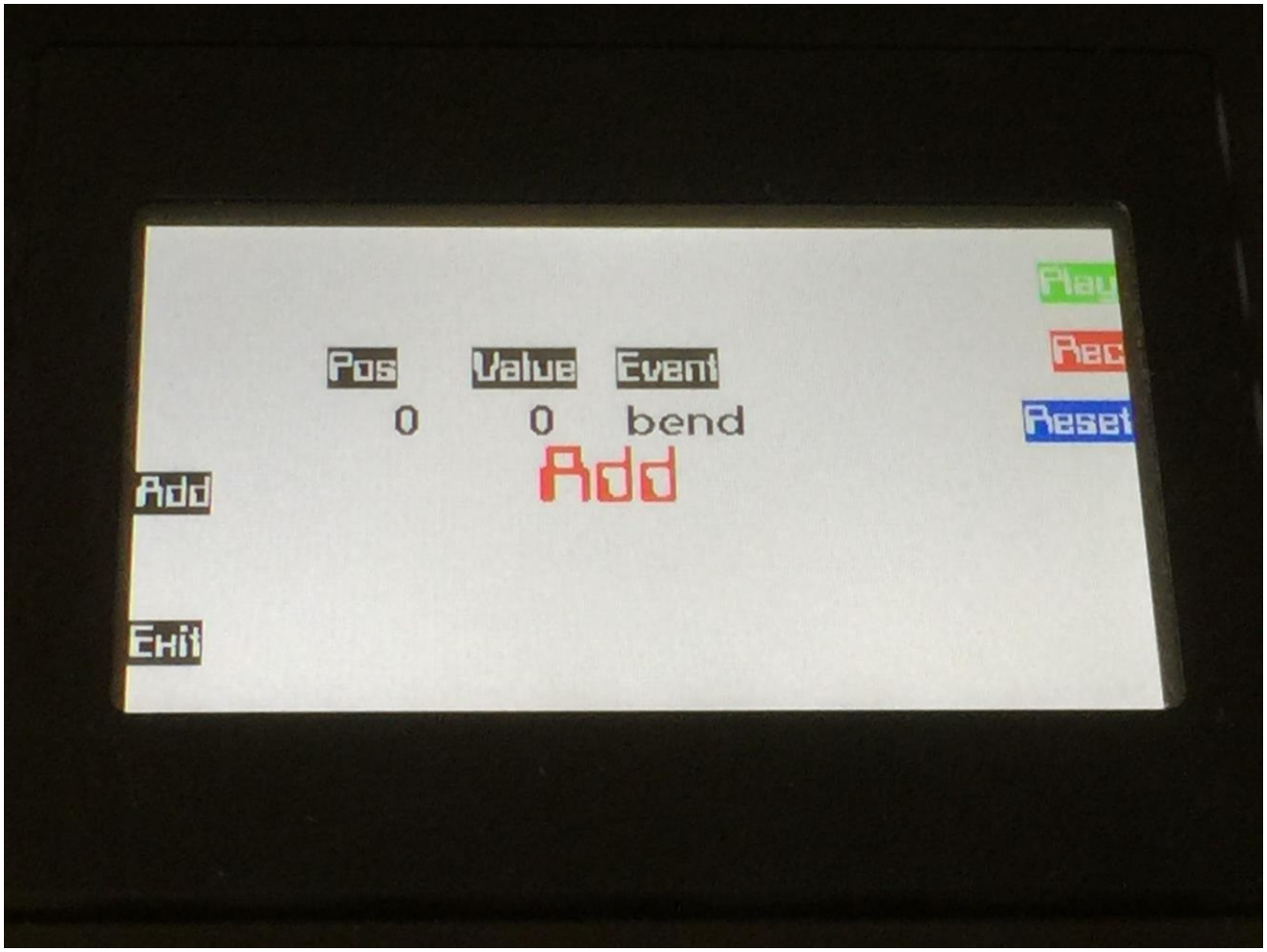


Push the ”Ctrl” button, to enter the controller events edit page:



On this first page, the controller edit main page, you will see a list of the controller events present on the selected track. Use the arrows on the left, to select an event type for editing.

If you would like to add other types of controller events, push the ”Add” button, to go to this page:



Here you can use Edit Knob 1 to select the position for the new event. The position can be from 0 to 95, and is showed in ticks. The new controller event is added in the bar selected on the controller event edit page, which will be explained on the next page of this manual.

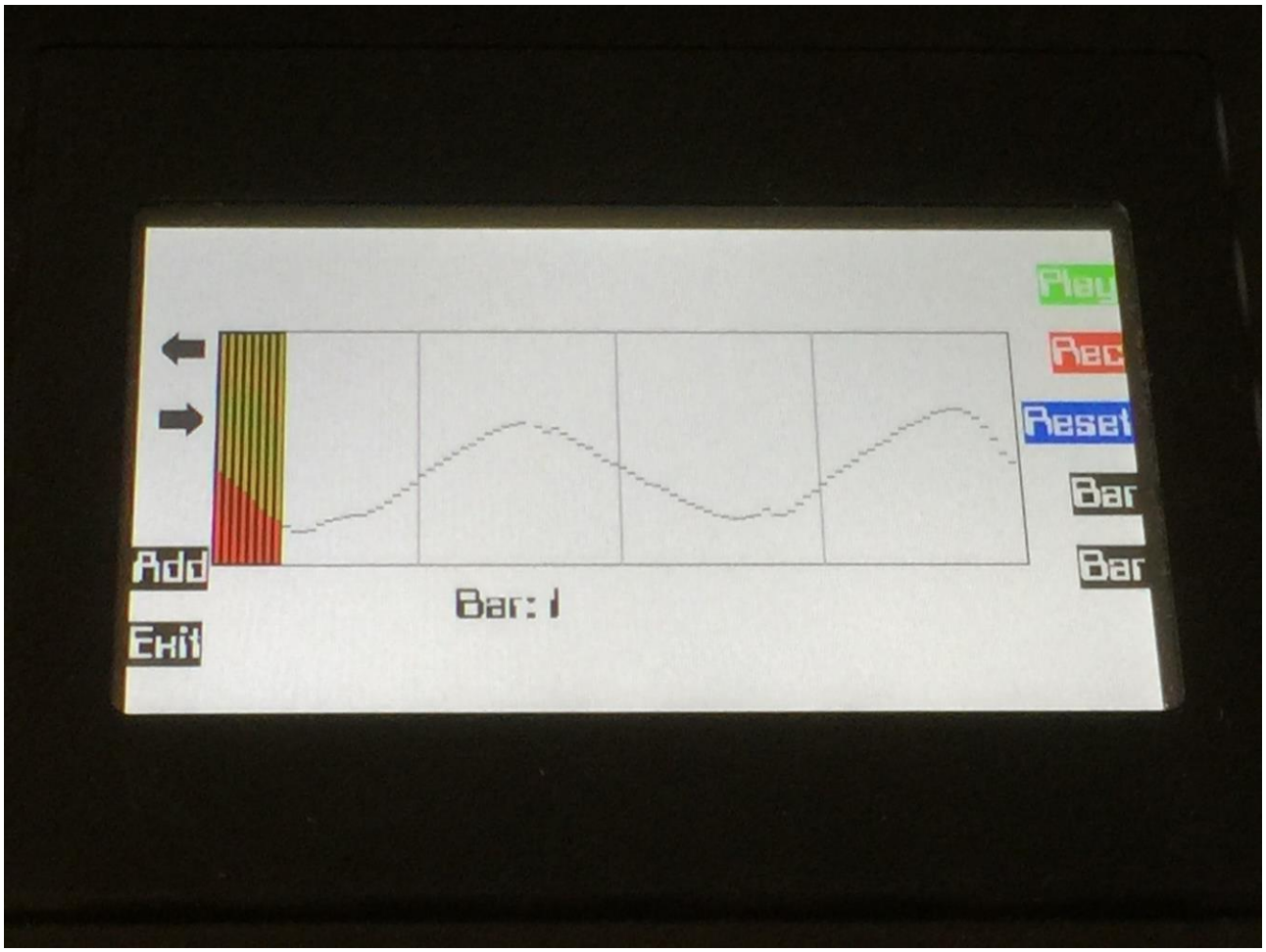
With Edit Knob 2 you can adjust the value for the new event.

With Edit Knob 3 you can select what type of event, you would like to add. The possible event types are:
-bend – Pitch Bend event
-prgr – Program change event
-maft – Mono aftertouch event
-cc0 to cc127 – MIDI CC 0 to 127

Every time you hit the ”Add” button on this page, a new event will be added.

When you are done adding events, hit the ”Exit” button, to return to the controller edit main page.

If you push the ”Edit” button on the controller edit main page, you will enter the edit page for the selected event:



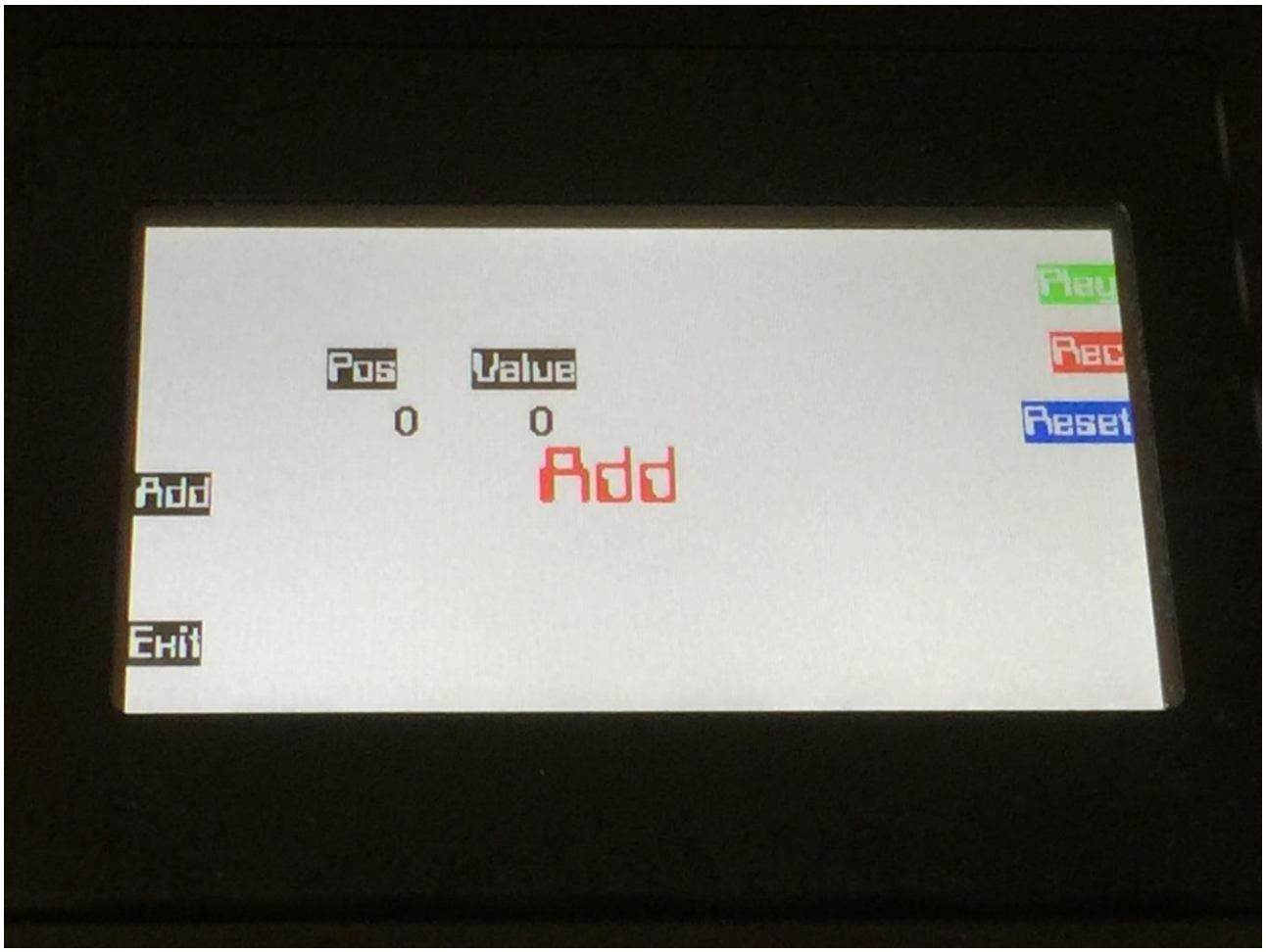
Eight events can be adjusted at a time, using the eight edit knobs.

Use the arrow buttons to select which eight events, you would like to adjust.

Use the ”Bar” buttons, to select the bar you would like to edit. The bar you select here, is also the bar where new events will be added, when using the ”Add” function on the controller edit main page.

When the sequencer is playing back, a pointer is rolling over the edit window, as the events are playing back.

On the controller edit page, it is also possible to add an extra event, of the same type as the one you are editing. Push the ”Add” button to go to this site:



Use Edit Knob 2 to set the position for the new event in ticks, inside the selected bar. Position can be 0 to 95.

Use Edit Knob 2 to adjust the value.

Every time you hit the ”Add” button on this page, a new event will be added.

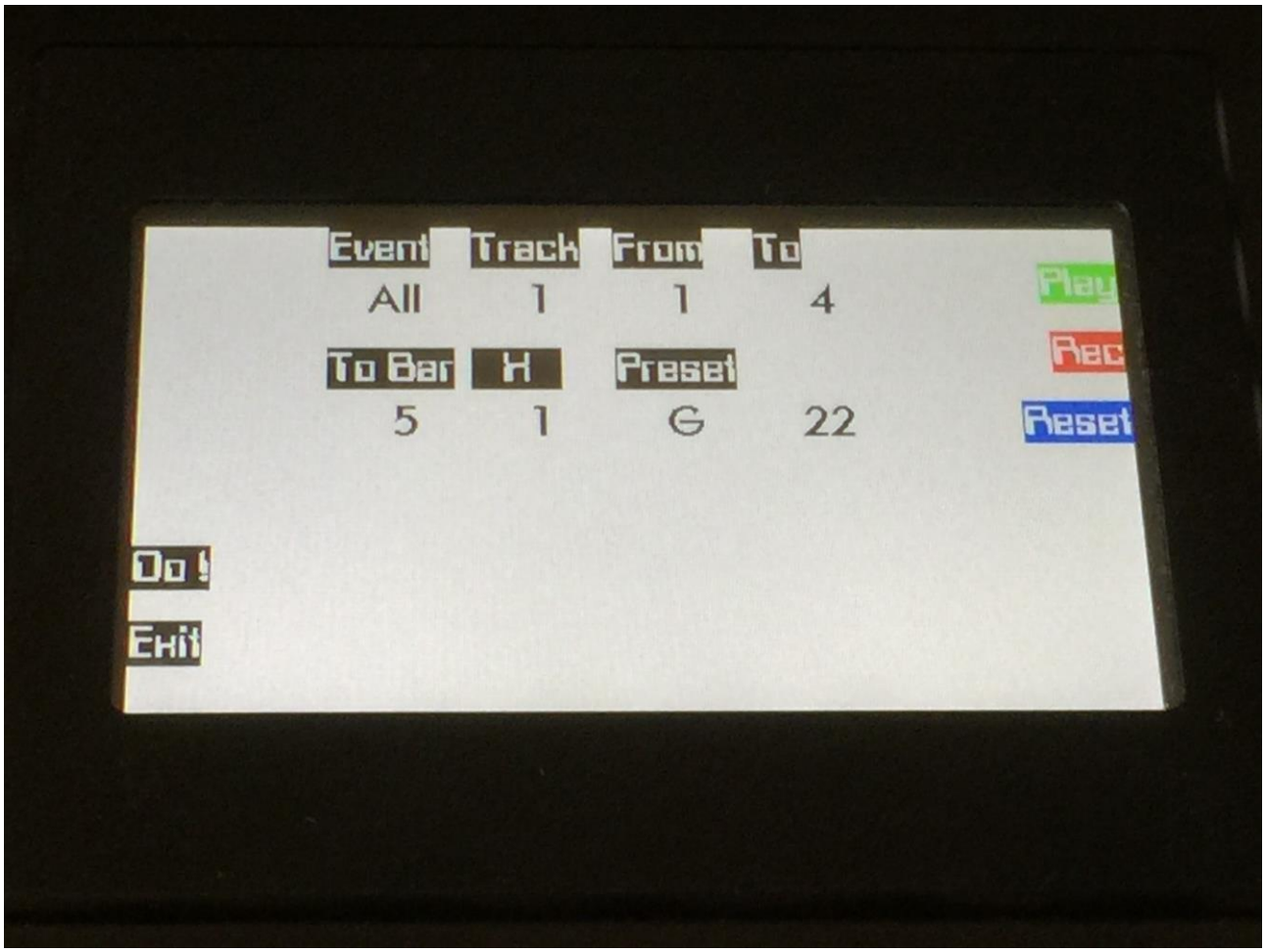
When you are done adding events, hit the ”Exit” button, to return to the controller edit main page.

Sequencer functions

Fuzion's sequencer also has a number of digital functions, like copy, delete, transpose and move. To access these, from the sequencer main page, push the "Func" button, to enter this page:

From this page, you can access all the functions explained on the next pages, by pushing their respective buttons.

Copy



The selected track will always be the destination track, of a copy. The source track and preset can be selected on this page.

The parameters on this page:

Event: Select the event type, you would like to copy:
-All – Copy all events from the selected bar range.
-Note – Copy note events from the selected bar range.
-CC's - Copy CC events from the selected bar range.
-Bend - Copy pitch bend events from the selected bar range.
-Maft – Copy mono aftertouch events from the selected bar range.
-Paft - Copy poly aftertouch events from the selected bar range.
-Prgr - Copy program change events from the selected bar range.

Track: Select the source track to copy from. Track 1 to 16 can be selected.

From: The first bar of the source track, that will be copied.

To: The last bar of the source track, that will be copied.

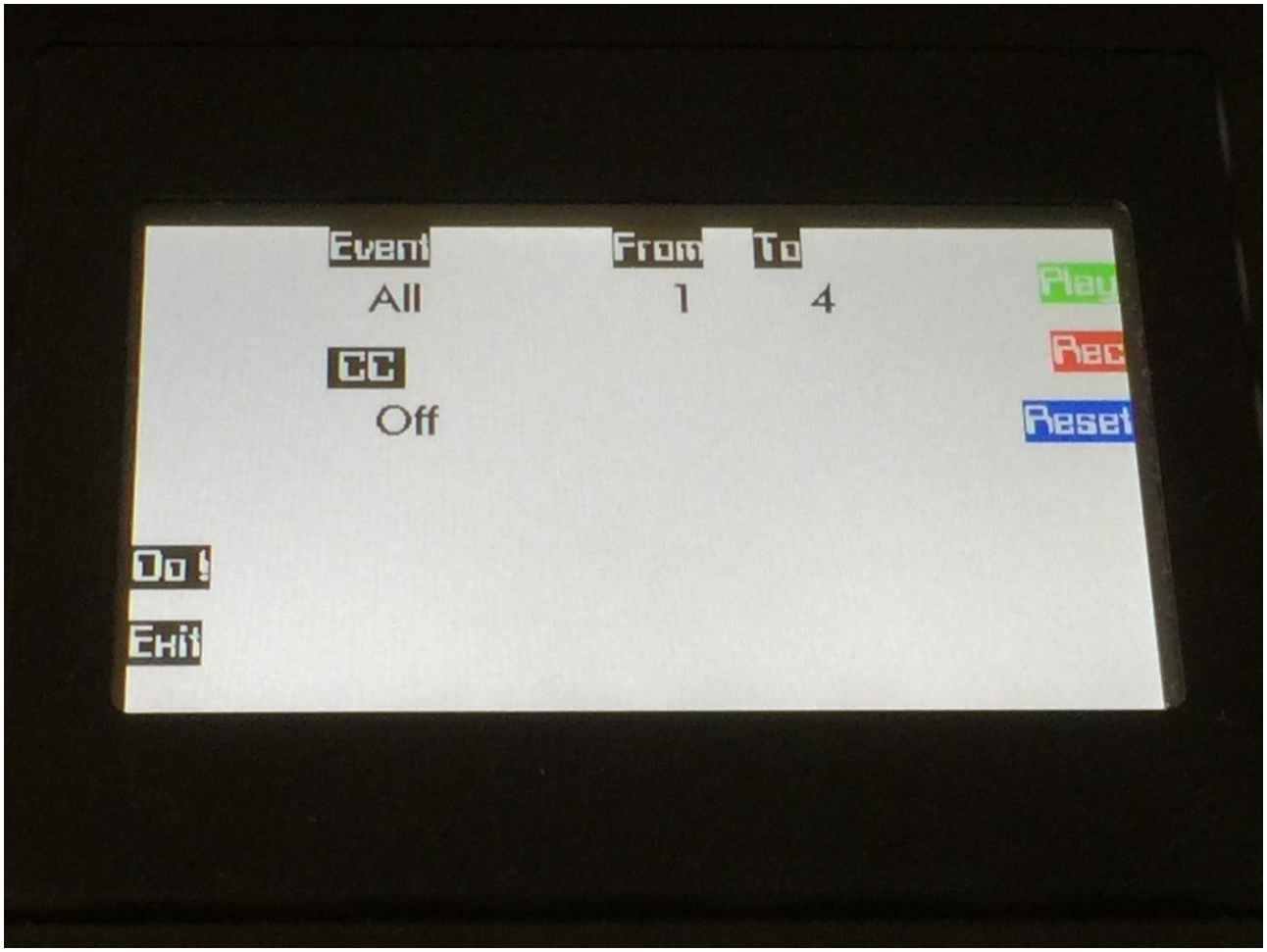
To bar: The first bar of the destination track, that the events will be copied to. Events that already exists in the range of the destination track, that is copied to, will be overwritten.

X: How many times the events should be repeated on the destination track. If this is 1, events will be copied 1 time.

Preset: The source preset, that will be copied from.

When you have adjusted all the settings, push the ”Do!” button to execute, or the ”Exit” button, if you regret.

Erase



This function will erase the selected events, inside the specified bar range.

The parameters on this page:

Event: Select the event type, you would like to erase:
-All – Erase all events from the selected bar range.
-Note – Erase note events from the selected bar range.
-CC's - Erase CC events from the selected bar range.
-Bend - Erase pitch bend events from the selected bar range.
-Maft – Erase mono aftertouch events from the selected bar range.
-Paft - Erase poly aftertouch events from the selected bar range.
-Prgr - Erase program change events from the selected bar range.

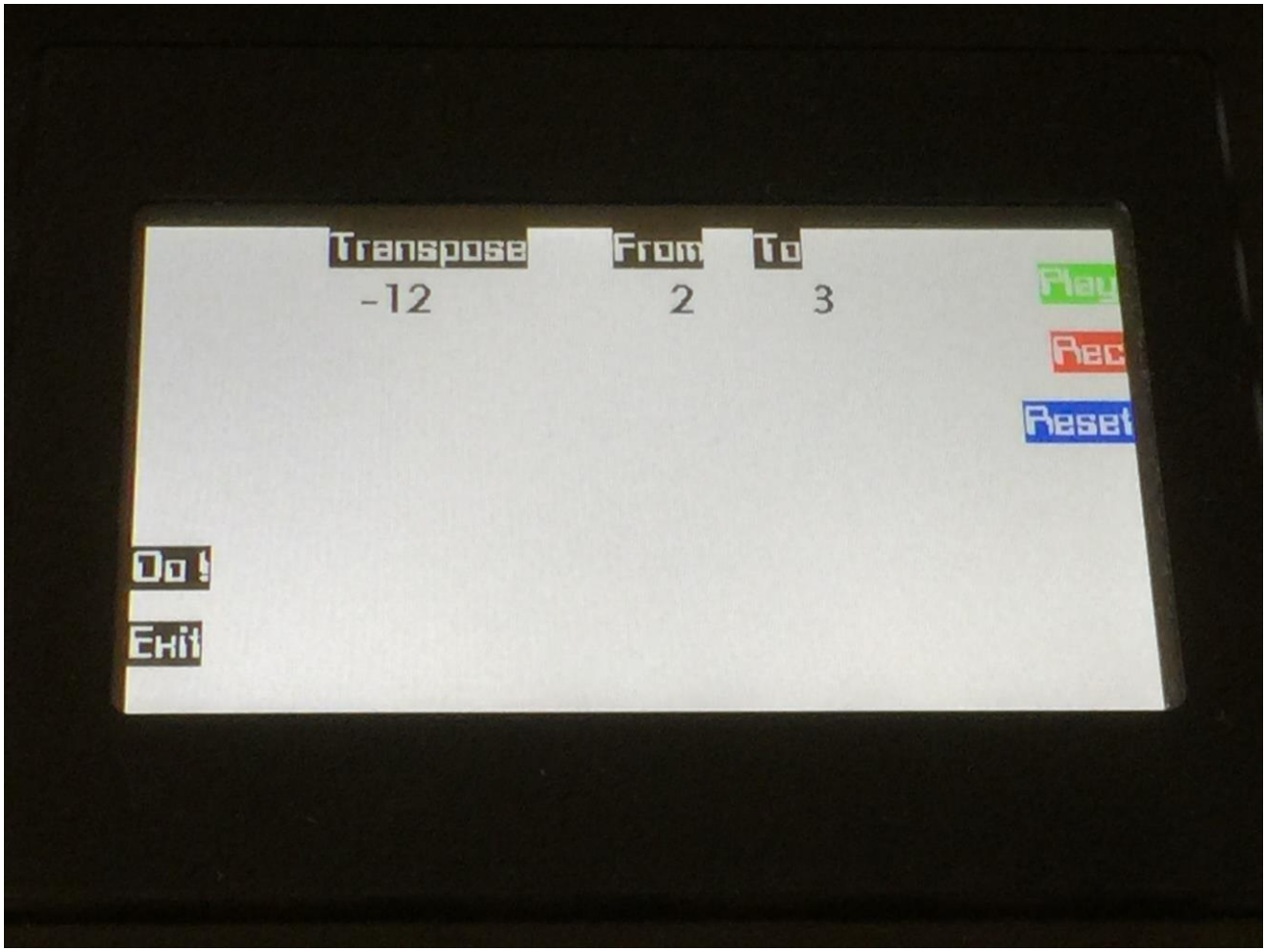
From: The first bar of the selected track, that will be erased.

To: The last bar of the selected track, that will be erased.

CC: If CC's are selected as the events to be erased, and you only wish to erase one specific CC number, choose the number with this parameter. If this is set to Off, all CC numbers will be erased.

When you have adjusted all the settings, push the ”Do!” button to execute, or the ”Exit” button, if you regret.

Transpose



This function will transpose note events inside the specified bar range up or down.

The parameters on this page:

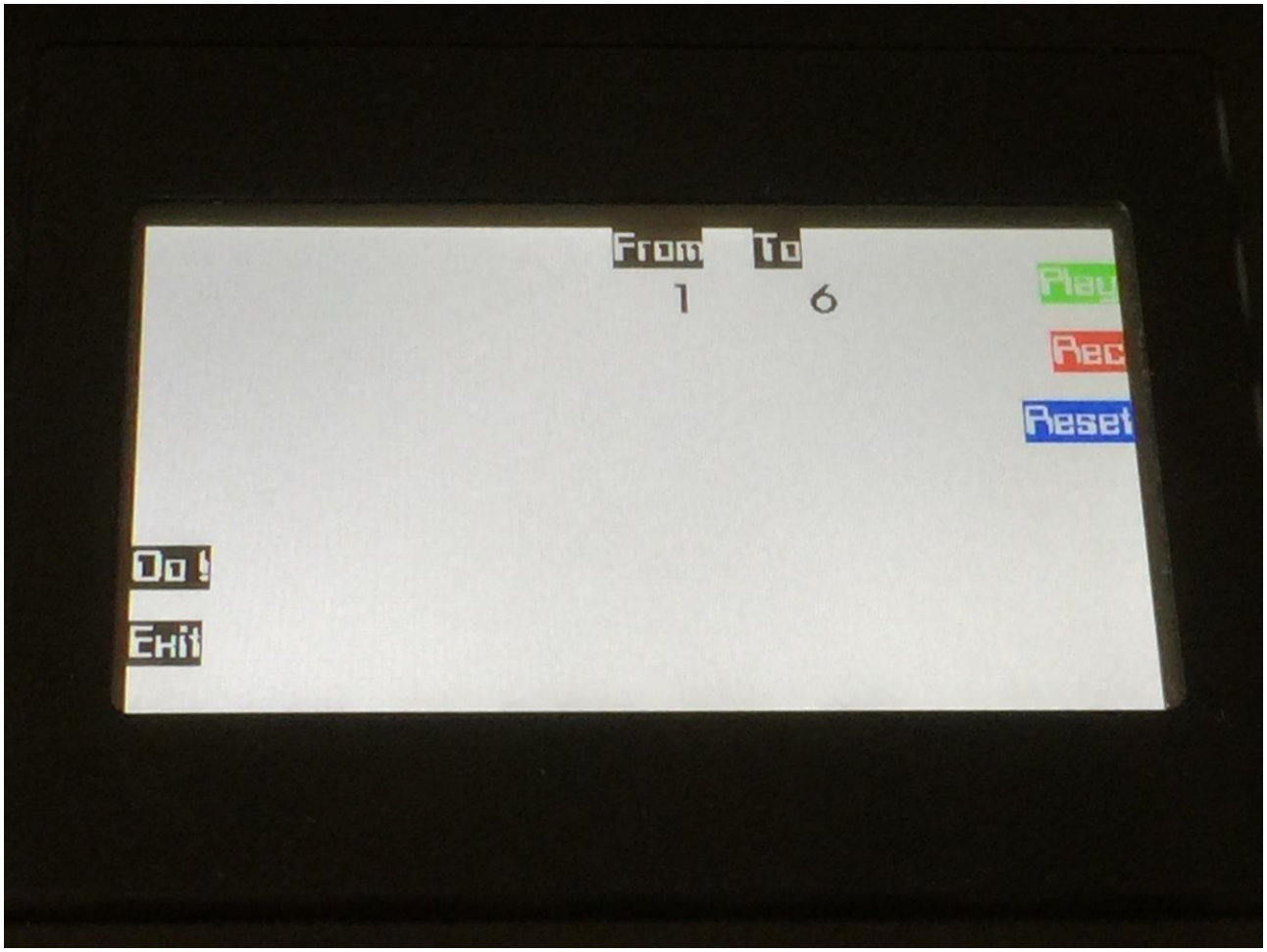
Transpose: Adjust how many semitones you would like to transpose the note events up or down. Value: -32 to +31.

From: The first bar of the selected track, that will be transposed

To: The last bar of the selected track, that will be transposed.

When you have adjusted all the settings, push the ”Do!” button to execute, or the ”Exit” button, if you regret.

Delete



This function will delete all events, inside the specified bar range. The difference between this and erase, are that with delete all events are removed, and if there are any events above the specified bar range, these will be moved down to replace the deleted events.

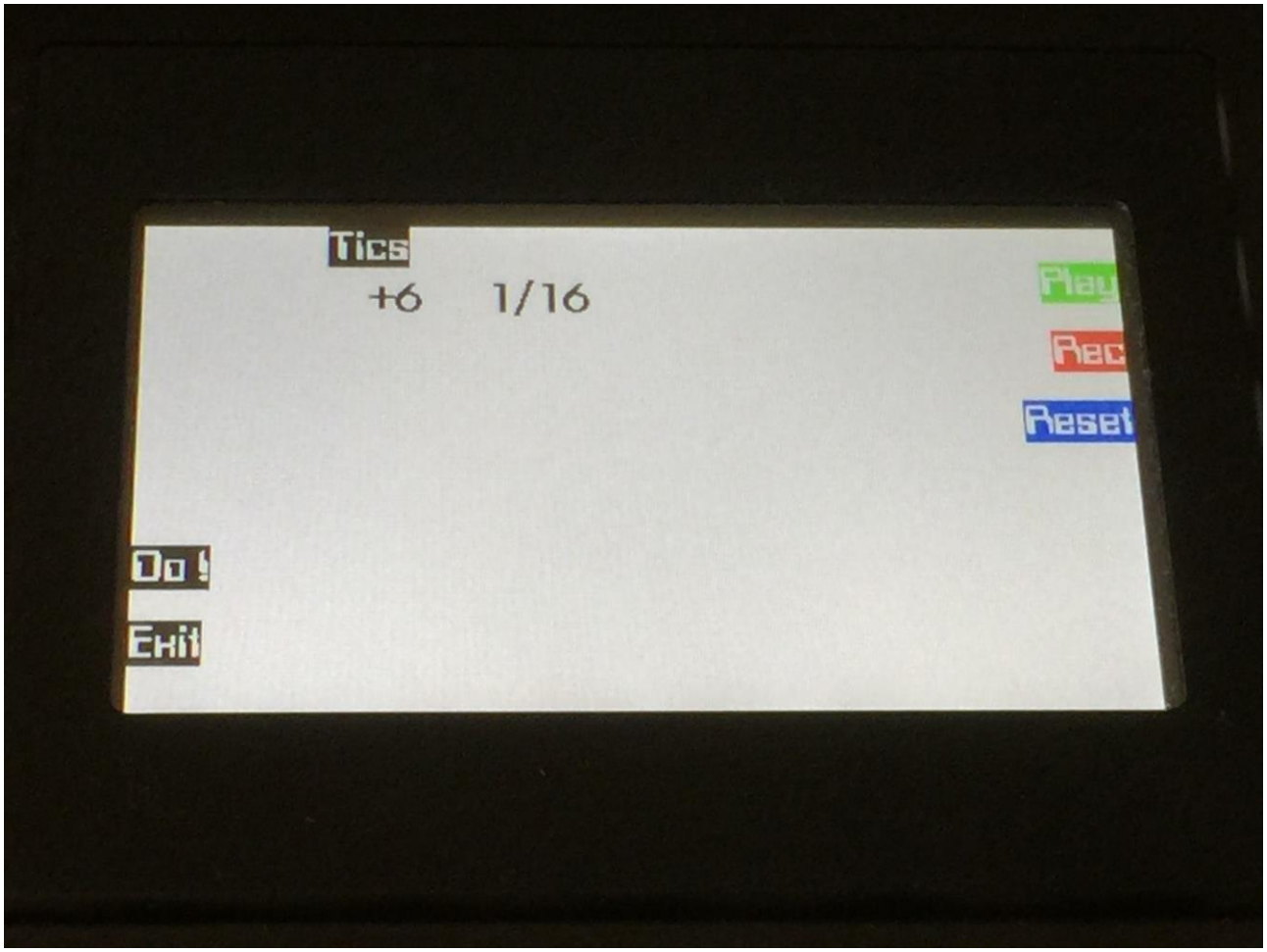
The parameters on this page:

From: The first bar of the selected track, that will be deleted.

To: The last bar of the selected track, that will be deleted.

When you have adjusted all the settings, push the ”Do!” button to execute, or the ”Exit” button, if you regret.

Move



This function will move all events on the selected track forwards or backwards.

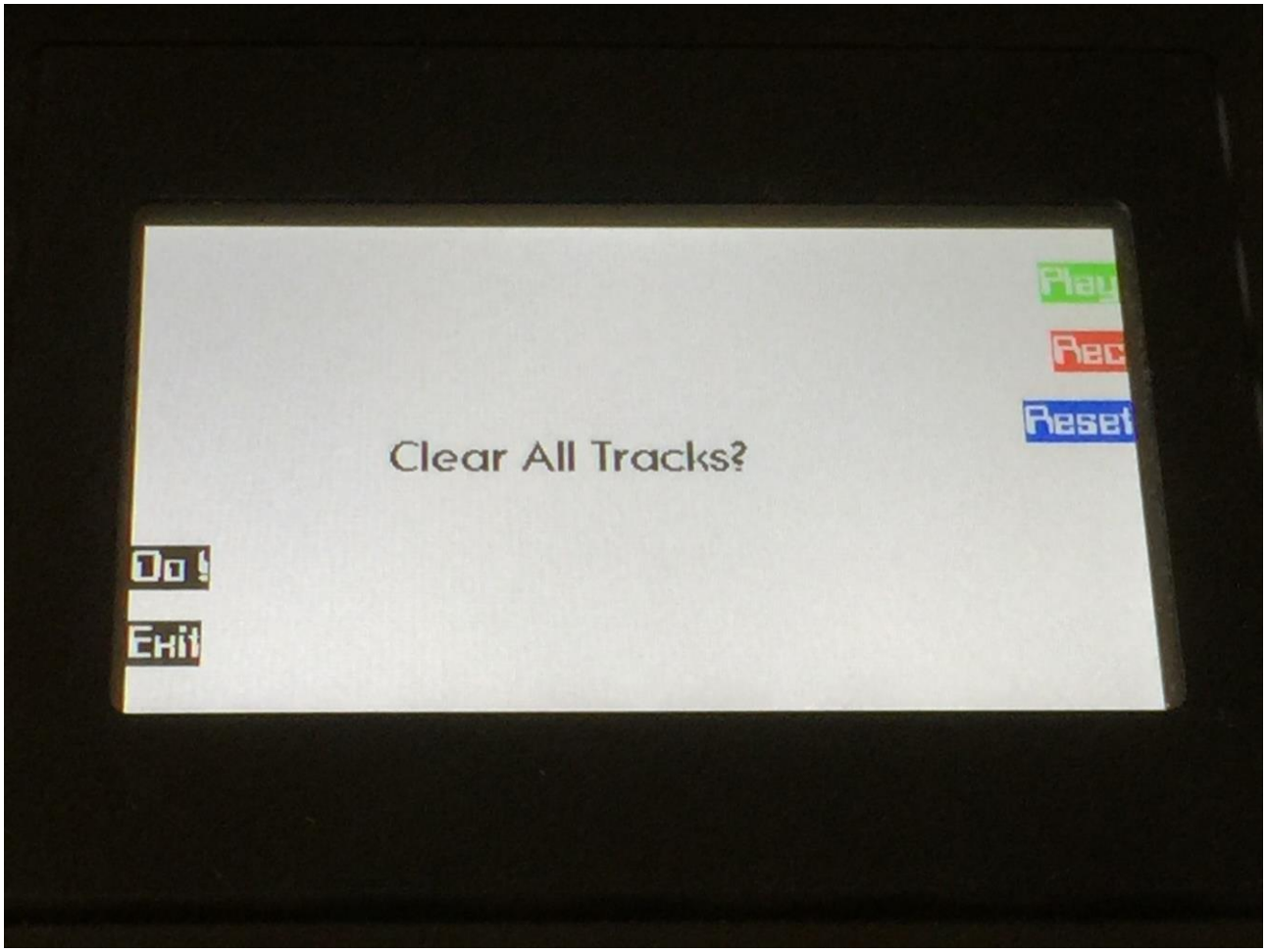
The parameters on this page:

Move: Adjust how many ticks, you would like to move the tracks events forwards or bakwards. A negative value moves the events backwards, a positive value moves the events forwards. A value of zero will not move the events at all. Value: -128 to +127.

The value is also shown rhytmically.

When you have adjusted all the settings, push the ”Do!” button to execute, or the ”Exit” button, if you regret.

Clear Seq



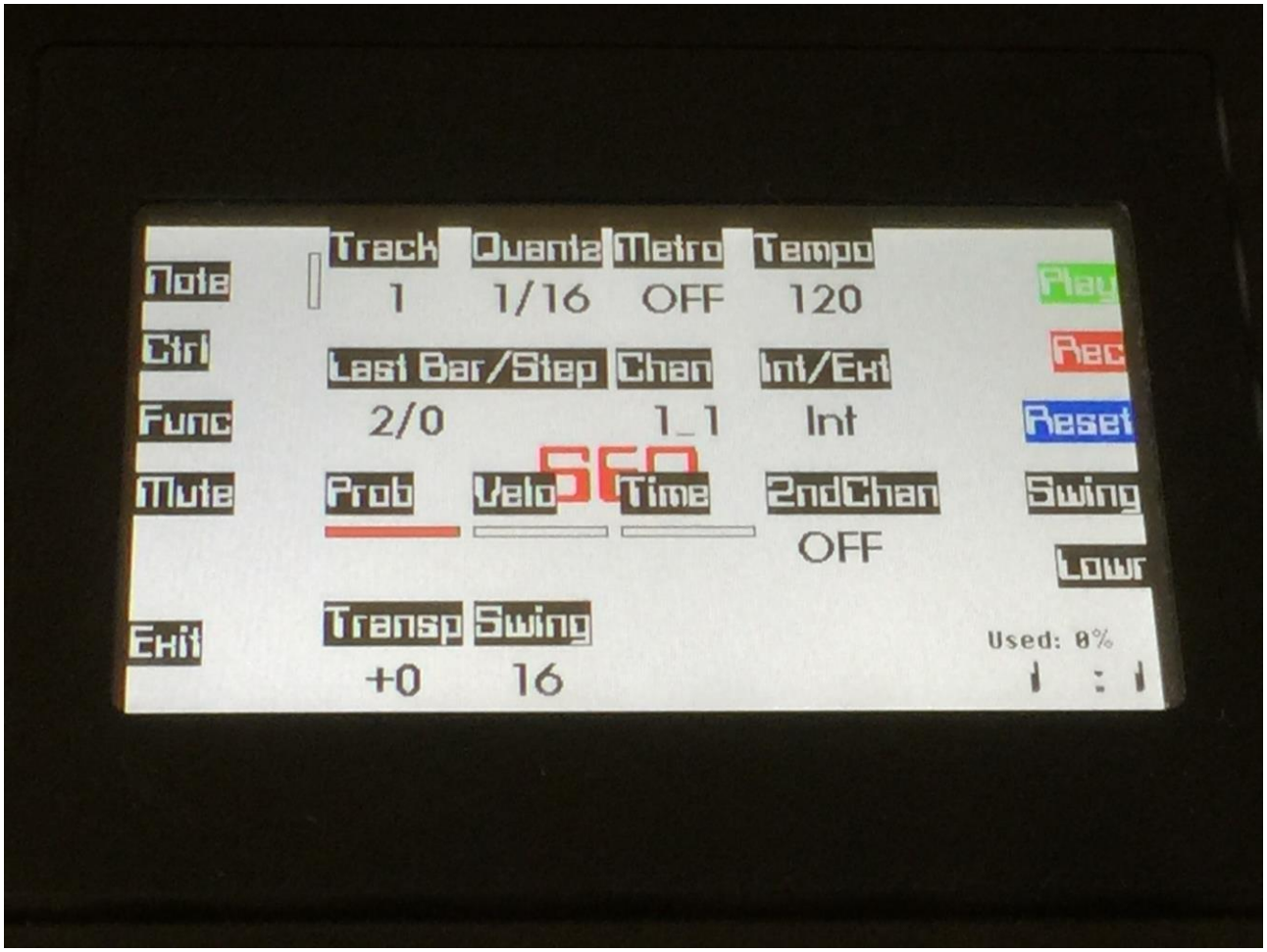
This function will delete all events on all 16 tracks of the sequencer.

If you are sure you would like to do this, push the ”Do!” button. Else Push ”Exit” to regret.

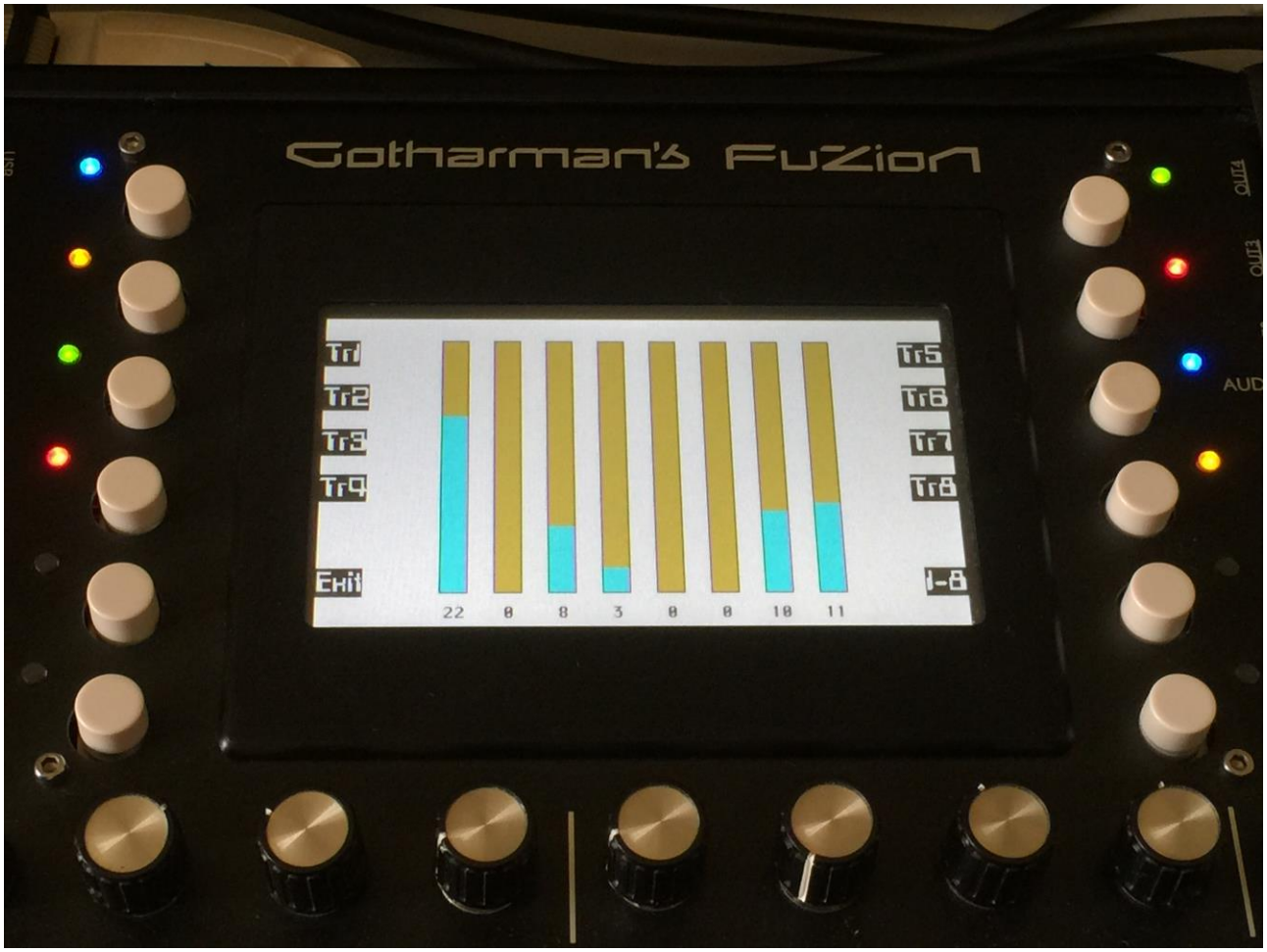
Swing

Fuzion’s sequencer has a fully programable swing generator.

The ”Swing” parameter on the sequencer main page, adjust how may steps the swing generator should have, from 1 to 16.

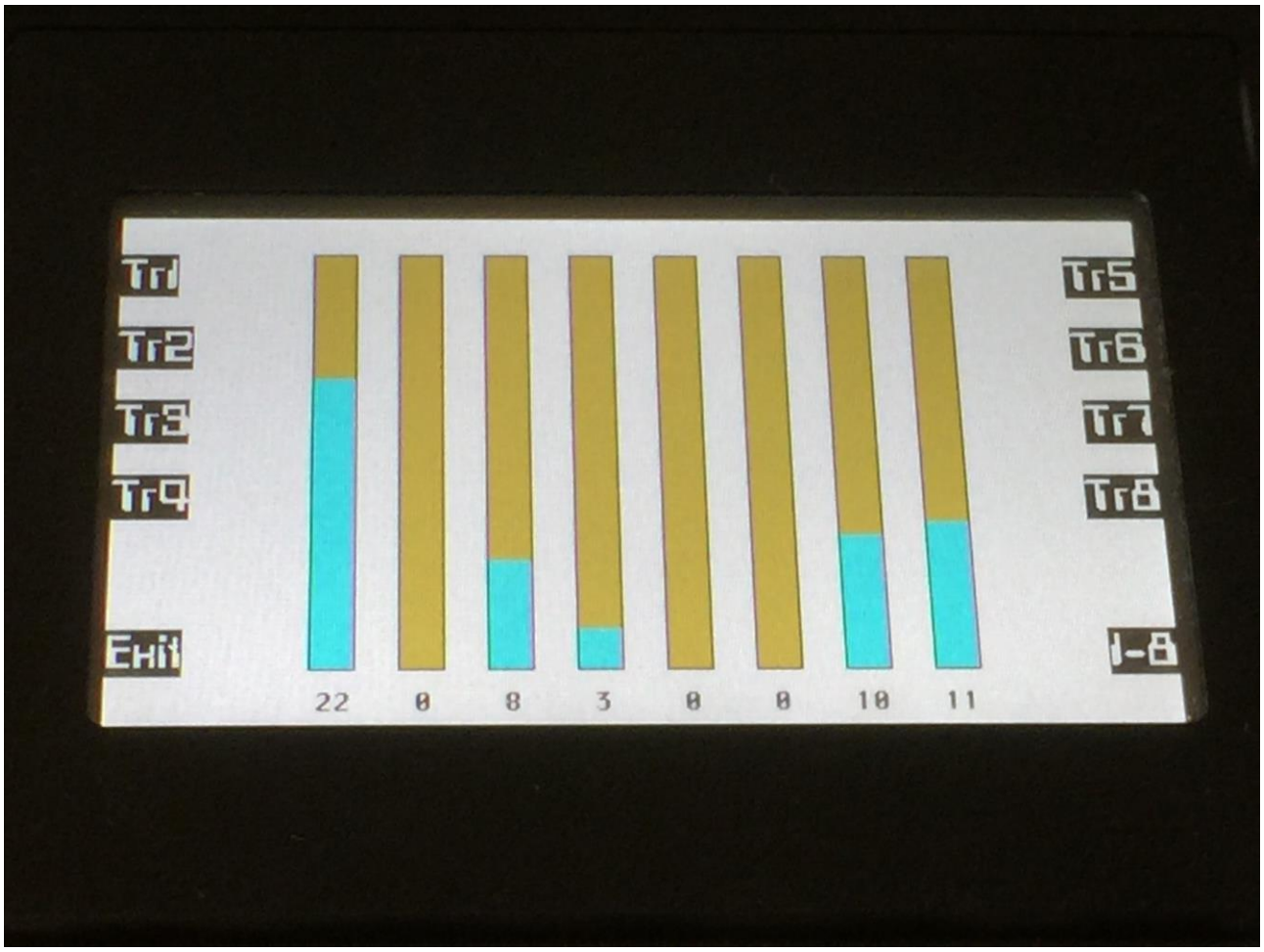


From the sequencer main page, push the ”Swing” button to enter the swing generator page:



On this page, swing can be switched on and off for each of the 16 sequencer tracks, by pushing the corresponding button. If a track LED lights up, swing will be applied to that track.

To switch between track 1 to 8 and track 9 to 16, push the ”1-8” button. The name of that button will change to ”9-16”, when you are viewing track 9 to 16.

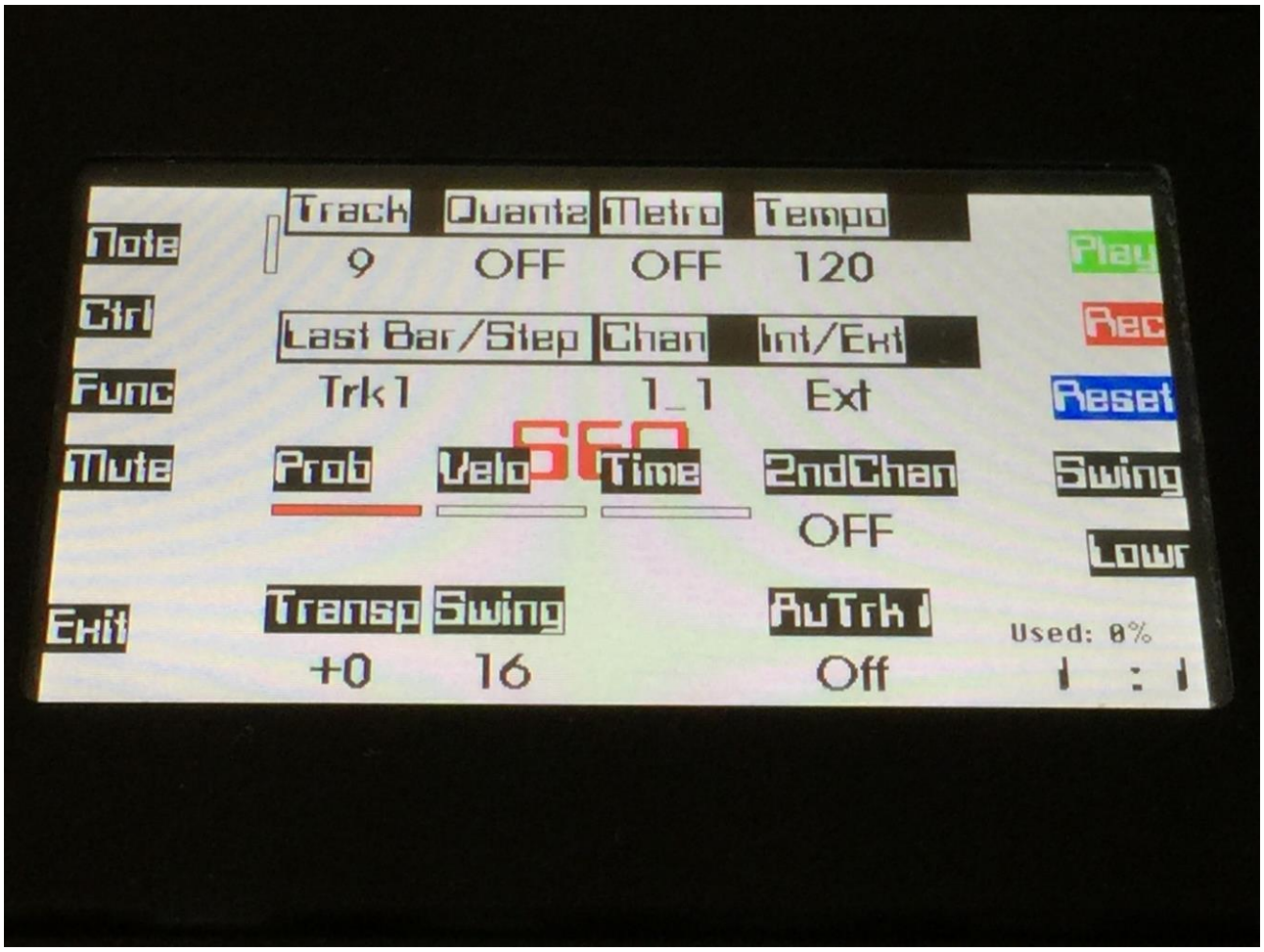


At writing moment, the swing generator are always set to 1/16 resolution. This might be changed in a future update.

Use the 8 edit knobs to adjust the delay in ticks for each step of the swing generator. The steps are played back sequentially with a 1/16th resolution. If the sequencer is playing back, the value bar of the step that is being played will be inverted.

To edit step 9 to 16 of the swing generator, push the ”1-8” button. The name of that button will change to ”9-16”, when you are viewing step 9 to 16.

Audio Tracks



Sequencer track 9 to 16 can be switched to ”Audio Track” mode.

When a track are in audio track mode, it does not record MIDI notes. Instead, when you start realtime recording, it will record an audio sample from the source selected on the Sample Rec page (audio inputs or outputs), to the sample bank selected on the Sample Rec page.
When recording is done, it will save this audio sample, assign it to a synth, and place an audio track note event on the sequencer track, that will trigger this synth.

This will allow for, a kind of, 8 tracks of pattern based harddisk recording. The length of the audio tracks can be adjusted separately, even after recording, and presets can be switched without any pauses, no matter if they have audio tracks or not.

MIDI controller events can still be recorded on audio tracks, if you would like to control something on the synth, used for it.

Please notice though, that the audio track itself, is not using the MIDI channelizer system, so you will have to set this up manually, to point at the synth used for the track.

If you activate realtime recording, on an audio track that already has audio recorded to it, only MIDI controller events will be recorded.
To re-record and audio track, you must first erase it. To do that, with the audio track selected, hit the ”Rec” button. ”Reset” will now change to ”Erase”. Hit the Erase button.
Switch Rec off, and then on again, to record a new audio track.

To record an audio track, on the Sequencer main page, select a track number between 9 and 16. On these tracks a parameter called ”AuTrkx”, where x indicates a number between 1 and 8, will appear in the lower right corner of the screen.
The number indicates what synth will be used for the audio track.
Track 9 = AuTrk1, uses Synth 1.
Track 10 = AuTrk2, uses Synth 2, and so on…

Push the ”Lowr” button, to select this parameter, and use edit knob 8 to switch the audio track mode for the selected track ”On”.
At the moment you do this, the synth assigned to this audio track are initialized for the purpose. Tune is set to middle position and the filter mix parameter is turned fully up, to bypass the filters. The sequencer transpose control is also set to the neutral position.

Now, hit the ”Lowr” button again, so it is not activated, and use edit knob 5 and 6, to adjust the track length. The track length adjusted before recording, will be the audio recording length. You can though stop the recording at any time, before it reaches the track end, if you like.

Hit the ”Rec” button. If the sequencer is already playing back, it will now reset and start a 2 bar metronome count-in. If the sequencer is stopped, please hit the ”Play” button, to start the count-in. After the count-in, it will start to record the audio. It will record until it reaches the adjusted track end, or until you hit the ”Play” button to stop it.

When the sequencer is stopped, after an audio track recording, the audio recording will be saved as a sampling with the name: AudioTr (preset number)-(track number), t.ex: AudioTr A01-12.
The sequencer tempo is saved together with the sample, as the sample tempo.
The sample tempo is used for calculating the start point, if you start playing back the preset from any other position, than position 0.0.0, and for calculating the rhythmical sample start point, if the Quantized Start function, explained later in this manual, is activated.

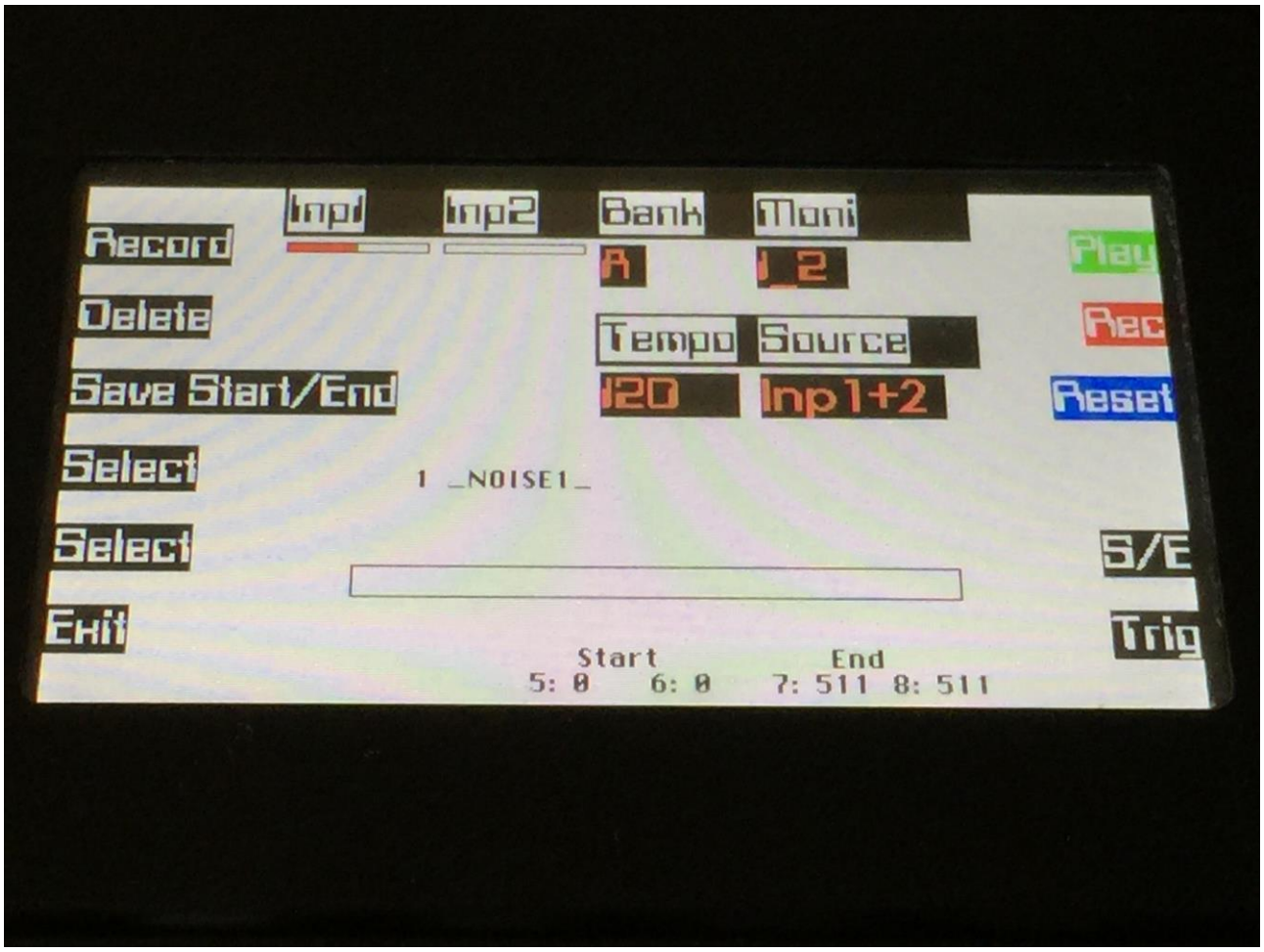
All audio track samples can be selected and exported, just like any other samples.

When a track are in Audio Track mode, the track VU-meters no longer shows the trigger event, but the actual audio output.

Using imported samples for Audio Tracks

It is also possible to use an imported .wav file sample as an audio track.

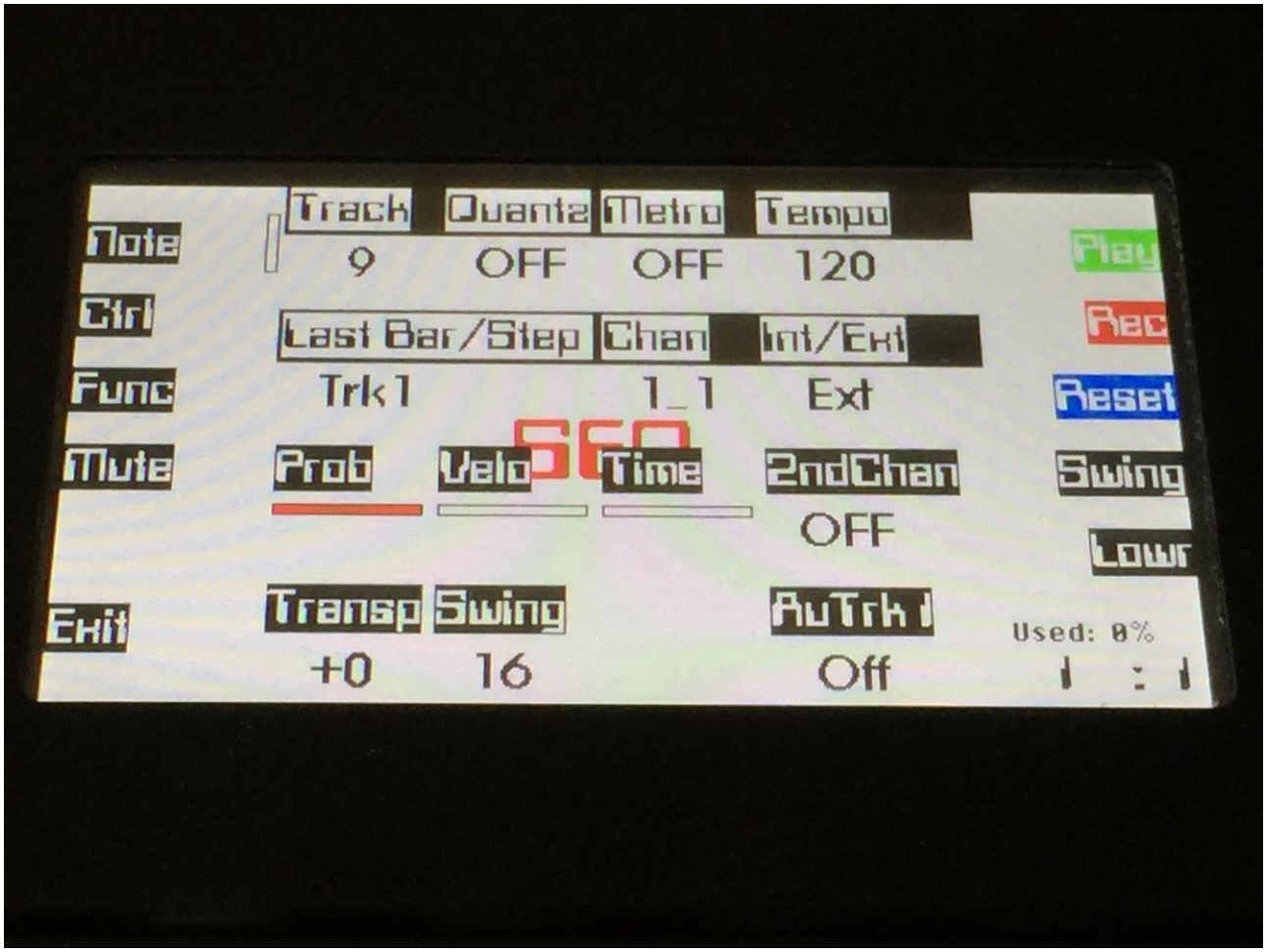
If you already know the tempo of the sample, you would like to use, you must first adjust this. After you have imported the sample via USB, go to the Sample Rec page:



Select the sample, using the ”Select” buttons. Adjust its tempo in BPM, using edit knob 7.
Push the ”Save Start/End” button.

If you do not know the tempo of the sample, please skip this step for now.

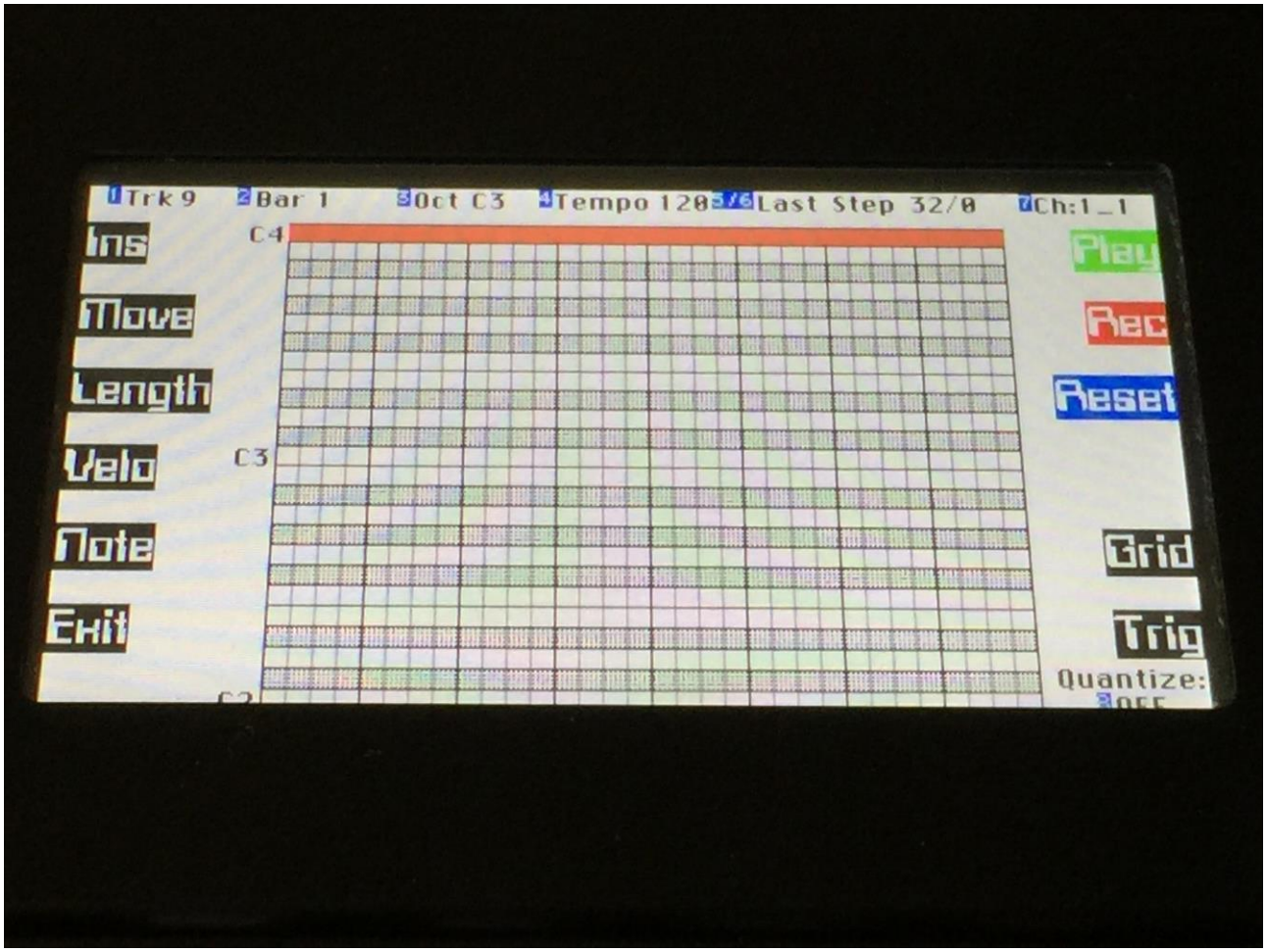
Now go to the sequencer main screen:



Select the track (between 9 and 16), that you would like to use for the audio track, and switch audio track mode on, as explained in the previous section.

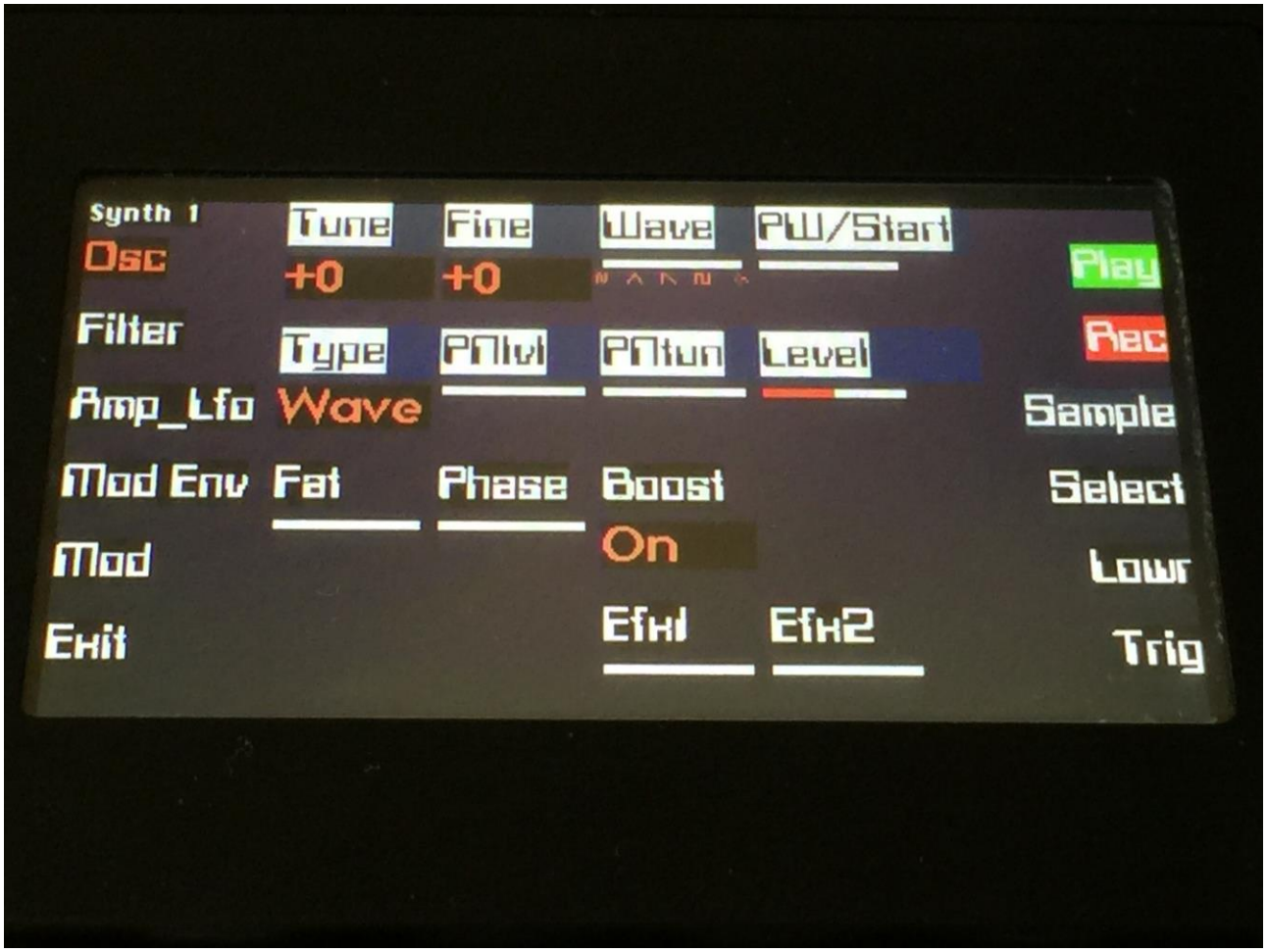
Adjust the track length.

Push the ”Note” button, to enter the note edit page:



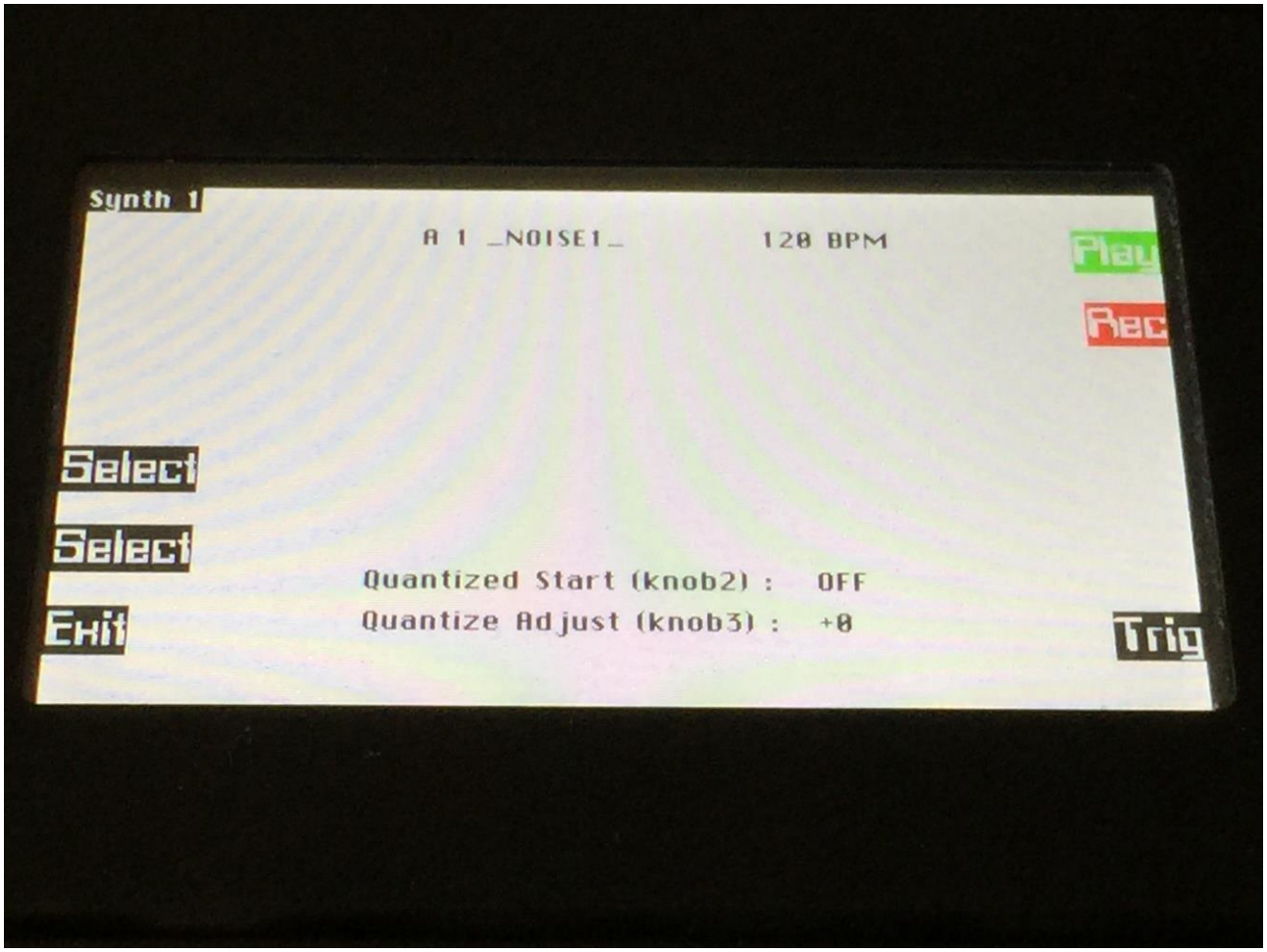
On this page, hit the ”Ins” button. An audio track note event will now be inserted, that eqauls the track length.

Go to the synth pages:



Select the synth used for the audio track. AuTrk1 = Synth1, AuTrk2 = Synth2 and so on….

Hit the ”Sample” button:



Select the imported sample, using the select buttons.

Push ”Play” to audition.

If you did not knew the sample tempo, now go back to the Sequencer Main screen, and adjust the sequencer tempo, until the audio track loops as it should.
When this is done, go to the Sample Rec page, adjust the sample tempo to the same as the sequencer tempo, and save it.

If the sample tempo is incorrect, the audio track will not continue from the right point, and the Quantized Start points will not fit. If these functions are not important to you, you do not have to bother about adjusting the sample tempo.

The 8 Synthesizer's

Fuzion has 8 powerful synthesiser's. Each of these can play back their own sound, and have their MIDI channels and key ranges set completely independent of each other. It is possible to create splits, layers and overlaps exactly how you like.

You can create your own sounds from scratch, or just tweak any of the preset sounds to your likings, or just use the preset sounds as they are.

To get a start point for a sound, Fuzion's synth section has a sound finder, that lets you audition and import the sounds from any other preset.

All Fuzion's synth sounds are chromatically playable over a 10 octave range. If you would like to just play a synth sound via a connected MIDI keyboard, you must make sure that the selected sequencer track is set to the same MIDI channel, as the synth you would like to play.

A Fuzion synth is monophonic. It is though possible to poly-chain several synths (up to 8), and play sounds polyphonically. It is also possible to decide, if the poly-chained synths should all play back the same sound, or if each of them should play back their own sound.

The first building block of a Fuzion synth sound are the oscillator. This creates the basic sound. A Fuzion oscillator can be a virtual analog waveform, a sampling, a noise waveform, a percussion waveform (multiple sinewaves + noise), or any of the 2 audio inputs.

On a Fuzion oscillator it is possible to adjust and modulate parameters like tune, pulse width, level and sample start point.

The output of the oscillator goes into 2 filters, that can be used to shape the sound. Each filter has 18 different types to choose from (16 filtertypes and 2 parametric EQ types). It is also possible to adjust the filter responses, to create completely new ones, using 3 adjust parameters. The 2 filters can be connected in serial or parallel, and their outputs can be mixed either normal or inverted. Each filter has a feedback loop. On some types this makes the sound sharper, on others it makes the sound more full.

On the filters, parameters like cutoff frequency, resonance and feedback can be adjusted and modulated.

The output of the filters goes into an amp section. The output level of the amp section is always controlled by the amp envelope, which is an advanced Fuzion ADSHRR type. The amp level can also be adjusted and modulated by any other modulation source.

The output of the amp goes into an instrument effect. Each synth has their own instrument effect. At writing moment, only a FAT effect can be selected for this, which can make really crazy things, but in future updates more instrument effect will be added.

The output of the instrument effect can be panned, assigned to output 1 / 2 or 3 / 4, and sent to global effect 1 and 2.

Modulation sources includes 3 ADSHRR envelopes, 2 LFO's and one random generator per synth, plus MIDI sources.

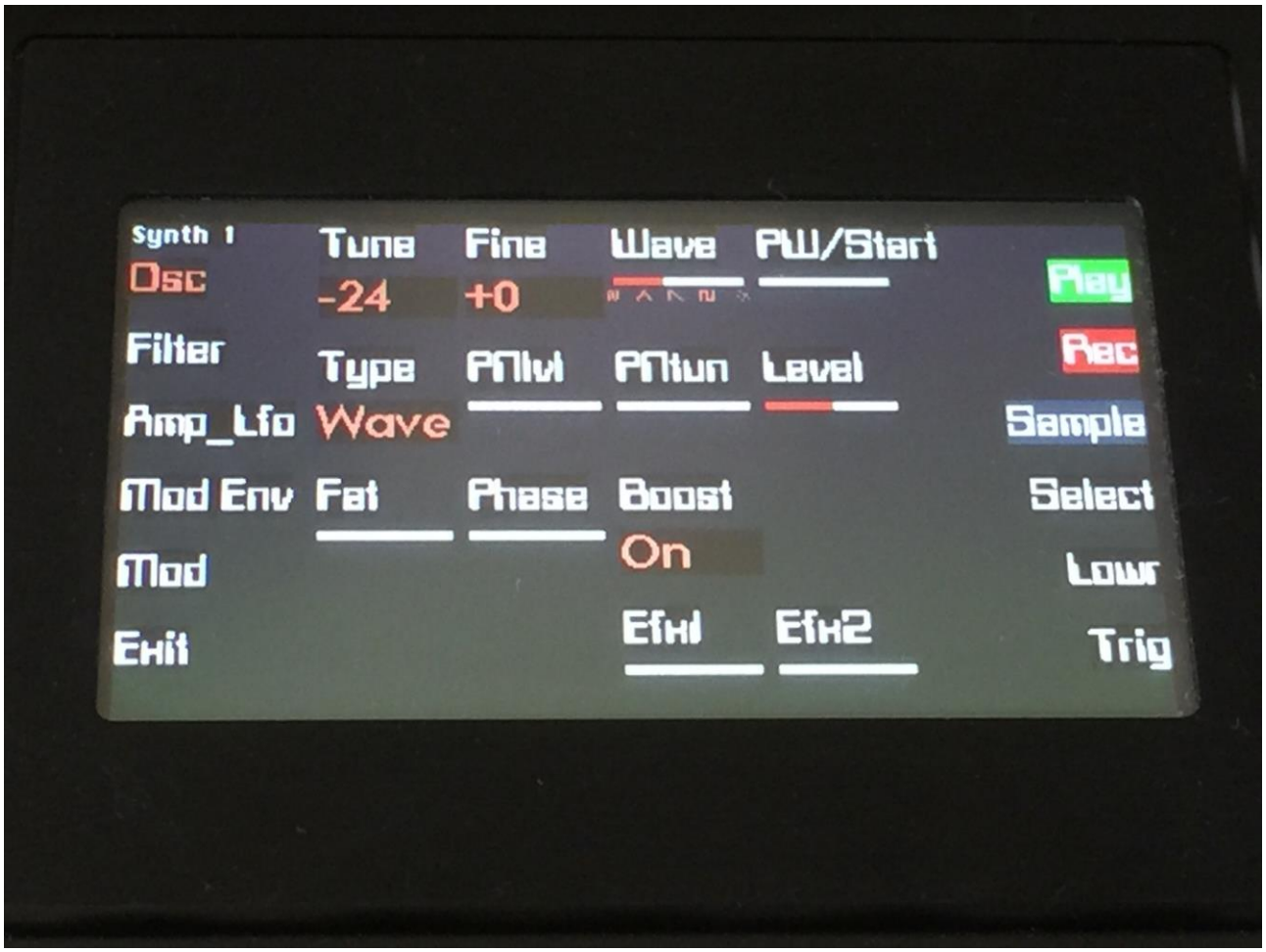
Remember to save all edits you do in the synthesizers. Else they will be lost when you change preset, or turn Fuzion off. See how to in the "Save Preset" section.

List of synthesizer modulation sources

Env1+ : ADSHRR envelope 1
Env1- : ADSHRR envelope 1 inverted
Env2+ : ADSHRR envelope 2
Env2- : ADSHRR envelope 2 inverted
Aen+ : ADSHRR amp envelope
Aen- : ADSHRR amp envelope inverted
Velo+ : The velocity value of the last received note event on the synth's MIDI channel
Velo- : The velocity value of the last received note event on the synth's MIDI channel inverted
Kyb+ : The note number value of the last received note event on the synth's MIDI channel
Kyb- : The note number value of the last received note event on the synth's MIDI channel inverted
Lfo1+ : LFO 1
Lfo1 - : LFO 1 inverted
Lfo2+ : LFO 2
Lfo2- : LFO 2 inverted
Rnd+ : Key trigged random generator. Each time a note event are received by the synth, the random generator output changes to a new random value.
Rnd- : Key trigged random generator inverted
Cc1+ : MIDI CC 1 received on the synth's MIDI channel
Cc1- : MIDI CC 1 received on the synth's MIDI channel inverted
Cc2+ : MIDI CC 2 received on the synth's MIDI channel
Cc2- : MIDI CC 2 received on the synth's MIDI channel inverted
Cc3+ : MIDI CC 3 received on the synth's MIDI channel
Cc3- : MIDI CC 3 received on the synth's MIDI channel inverted
Cc4+ : MIDI CC 4 received on the synth's MIDI channel
Cc4- : MIDI CC 4 received on the synth's MIDI channel inverted
Cc5+ : MIDI CC 5 received on the synth's MIDI channel
Cc5- : MIDI CC 5 received on the synth's MIDI channel inverted
Cc6+ : MIDI CC 6 received on the synth's MIDI channel
Cc6- : MIDI CC 6 received on the synth's MIDI channel inverted
Cc7+ : MIDI CC 7 received on the synth's MIDI channel
Cc7- : MIDI CC 7 received on the synth's MIDI channel inverted
Cc8+ : MIDI CC 8 received on the synth's MIDI channel
Cc8- : MIDI CC 8 received on the synth's MIDI channel inverted
Cc9+ : MIDI CC 9 received on the synth's MIDI channel
Cc9- : MIDI CC 9 received on the synth's MIDI channel inverted
Cc10+ : MIDI CC 10 received on the synth's MIDI channel
Cc10- : MIDI CC 10 received on the synth's MIDI channel inverted
Cc11+ : MIDI CC 11 received on the synth's MIDI channel
Cc11- : MIDI CC 11 received on the synth's MIDI channel inverted
Cc12+ : MIDI CC 12 received on the synth's MIDI channel
Cc12- : MIDI CC 12 received on the synth's MIDI channel inverted
Cc13+ : MIDI CC 13 received on the synth's MIDI channel
Cc13- : MIDI CC 13 received on the synth's MIDI channel inverted
Cc14+ : MIDI CC 14 received on the synth's MIDI channel
Cc14- : MIDI CC 14 received on the synth's MIDI channel inverted

Cc15+ : MIDI CC 15 received on the synth's MIDI channel
Cc15- : MIDI CC 15 received on the synth's MIDI channel inverted
Cc16+ : MIDI CC 16 received on the synth's MIDI channel
Cc16- : MIDI CC 16 received on the synth's MIDI channel inverted
Cc17+ : MIDI CC 17 received on the synth's MIDI channel
Cc17- : MIDI CC 17 received on the synth's MIDI channel inverted
Cc18+ : MIDI CC 18 received on the synth's MIDI channel
Cc18- : MIDI CC 18 received on the synth's MIDI channel inverted
Cc19+ : MIDI CC 19 received on the synth's MIDI channel
Cc19- : MIDI CC 19 received on the synth's MIDI channel inverted
AftT+ : Mono aftertouch received on the synth's MIDI channel
AftT- : Mono aftertouch received on the synth's MIDI channel inverted

From the Preset Select page, push the ”Synth” button to enter the first synth page:



Here you can select the different synth building blocks by pushing the respective buttons to the left, adjust the parameters using the 8 edit knobs, select what synth to edit, by pushing the ”Select” button, and assign a sampling to the synth by pushing the ”Sample” button.

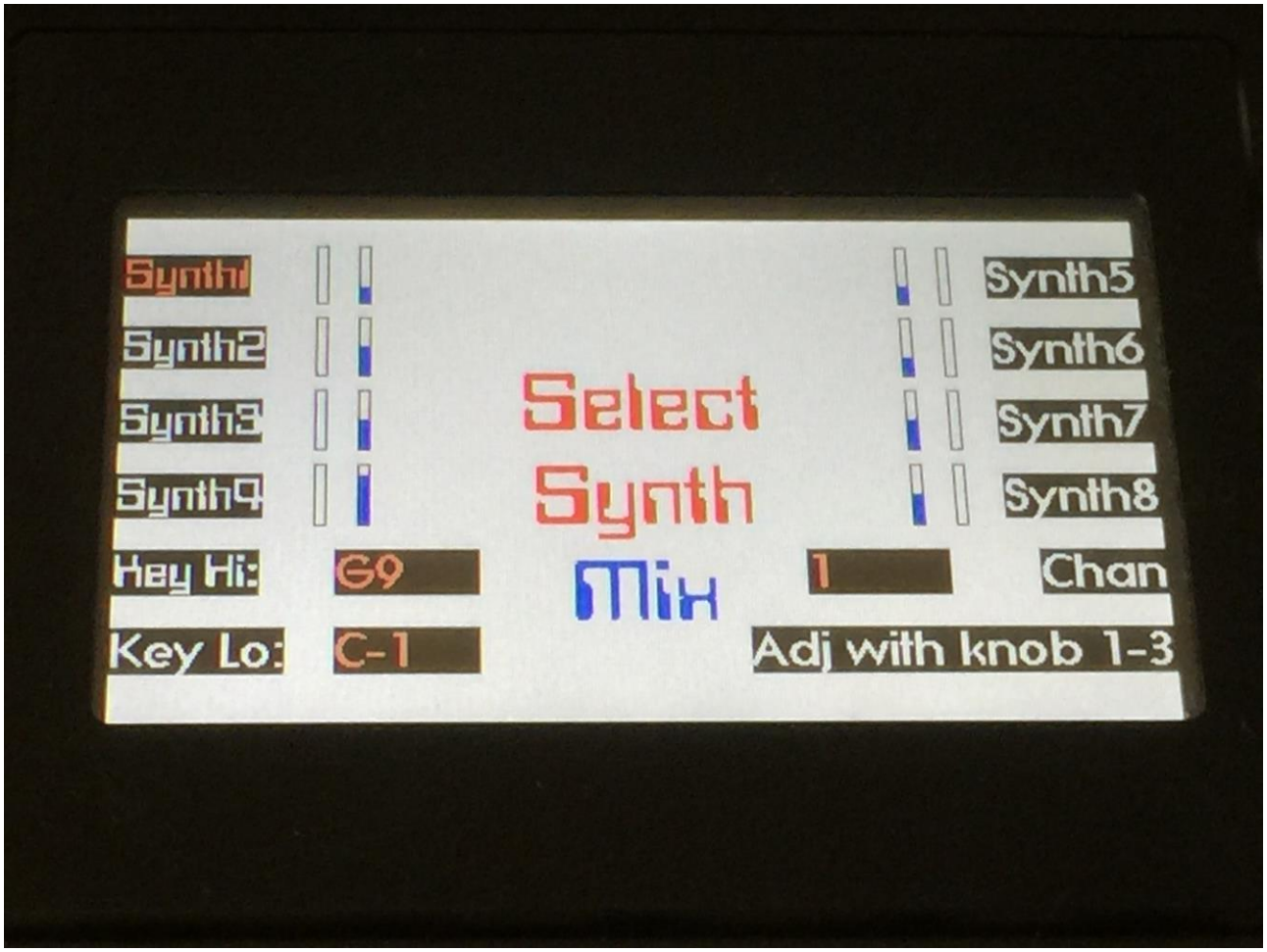
On any other pages than the oscillator page, it is possible to access the sound finder by pushing the ”Sound” button.

In the upper left corner of any synth edit page, you can see which of the 8 synths, that your are editing right now.

Most synth pages has more than 8 parameters to adjust. The ”Lowr” button is used to select whether the 8 edit knobs, edits the parameters on the upper half of the screen or those on the lower half of the screen. When the Lowr button LED is turned off, the edit knobs adjusts the parameters on the upper half of the screen. When it is turned on, the edit knobs adjusts the parameters on the lower half of the screen.

Many of the synth parameters can be modulated. To access the modulation setup page for Osc, Filter, Amp_Lfo and Mod Env, simply push the ”Mod” button, when you are on any of these pages. When you do that, it’s blue LED will light, and a new page will pop up, with the modulation parameters.

To select a synth for editing, or to adjust the MIDI channel and key range for the synths, from any synth page, push the ”Select” button, to enter this page:



To select a synth for editing, simply push the respective button, for that synth number, and Fuzion will take you back to the synth edit pages, for the synth that you selected.

Each of the 8 synths has a VU-meter on this page, that shows when the synth is trigged. Right beside each VU-meter are a blue bar, that shows the output level of each synth. The output levels can be adjusted, using the 8 edit knobs.

To adjust the MIDI channel and key range settings, you should push the ”Adj with knob 1-3” button, so the red LED near it lights up. Now it is possible to select any of the 8 synths, without jumping back to the synth edit pages.

So now you can select any of the 8 synths, and use edit knob 1 to 3, to adjust the low and the high key of the key range, and the MIDI channel.

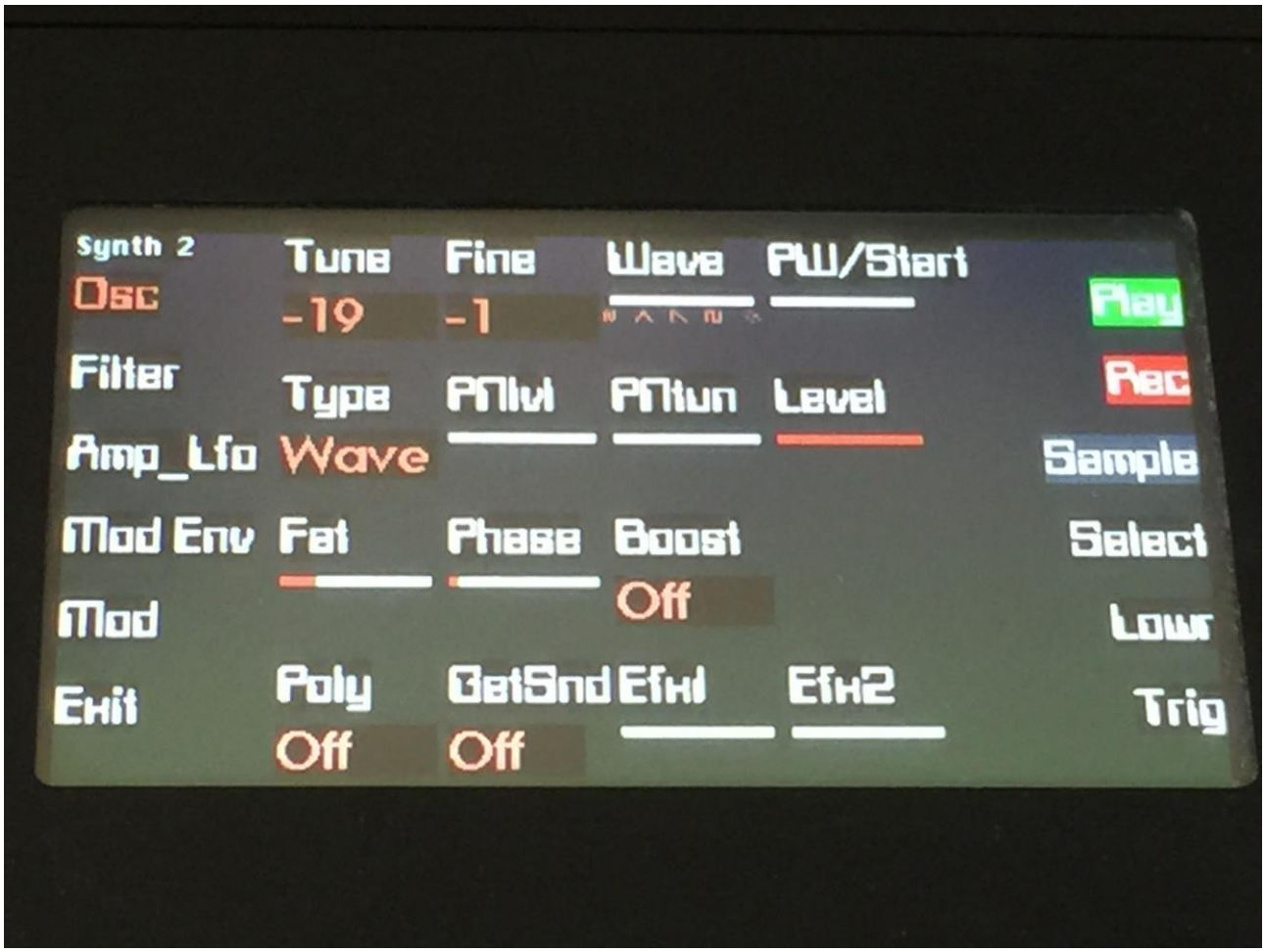
You can without any problems layer and overlap the synths. Fuzion can handle it!

There’s a few other function here:
If you push the ”Chan” button, the selected synth will be set to the same MIDI channel as the selected sequencer track.

It you push the ”Key Hi” or ”Key Lo” buttons, you can select the upper and lower keys of the synths key range, by playing these notes on a connected MIDI keyboard.

To exit from the synth select page, make sure that neither ”Adj with knob 1-3”, ”Key Hi” or ”Key Lo” is selected, and then push any of the 8 synth select buttons, to return to the synth edit pages.

Oscillator (Osc) parameters



Tune: Adjust the basic pitch in semitones. When an audio input is selected as the oscillator, this parameter has no function. Range: -64 to + 63.

Fine: Fine tuning of the pitch. When an audio input is selected as the oscillator, this parameter has no function. Range: -256 to +255.

Wave: When ”Wave” is selected as the oscillator, this parameter lets you morph between sine, triange, saw, pulse and feedback waves.

When ”Perc” is selected as the oscillator, this parameter adjusts the level balance of the 4 sinewaves.

When ”Sample”, ”Noise” , ”Audio In” or ”AuTrk” is selected as the oscillator, this parameter does nothing.

PW/Start: When ”Wave” is selected as the oscillator, this parameter adjusts the pulse width of the waveform. Unlike many other oscillators, the pulse width can be adjusted on all Fuzion’s waveforms, not just the pulse wave.

When ”Noise” is selected as the oscillator, this parameter adjusts the intensity of the noise.

When ”Sample” or ”AuTrk” is selected as the oscillator, this parameter adjusts the sample start point.

When ”Perc” is selected as the oscillator, this parameter adjusts the detuning of the sinewaves.

When ”Audio In” is selected as the oscillator, this parameter does nothing.

Type: This parameter selects the oscillator type. At writing moment, the possibilities are:

-Wave: Virtual analog oscillator. The Wave parameter lets you morph between sine, triangle, saw, pulse and feedback waveforms. The PW parameter lets you adjust the pulsewidth of any of the waveforms.

-Noise: Generates a noise waveform. At some tune settings, the noise becomes metallic. The PW parameter lets you adjust the intensity of the noise.

-Smpl (Sample): Plays back a sampling, every time it is triggered by a note on. The sample to play back can be selected by pushing the ”Sample” button on this page. The PW parameter lets you adjust the sample start point.

-Perc: Generates sounds that are great for percussion voices, but can also be used for other types of sounds. It generates 4 sinewaves and a noise wave. The level balance of the 4 sinewaves can be adjusted by the ”Wave” parameter, and the detuning of them can be adjusted by the ”PW” parameter. The noise level can be adjusted by the ”PNlvl” parameter, and the noise tune can be adjusted by the ”Pntun” parameter.

On synth 1 to 4, the sinewaves and the noise are mixed together, and goes into both of the filters.

On synth 5 to 8, the sinewaves goes into filter 1, and the noise goes into filter 2.

-Ain1, Ain2: Audio in 1 and 2. By selecting an audio input as an oscillator, you can run external gear through Fuzion’s filters and effects. It is possible to select an audio input as the oscillator on multiple synths, if you would like to run a signal through many filters at the same time.

If you only wants to hear the signal going through the filters, make sure to go to the Sample Rec page, and turn ”Moni” (monitor) off.
To let the audio signal through, without having to constantly trigger the synth, you should go to the ”Amp_Lfo” page, and turn the ”Drone” parameter up.

-AuTrk: Audio Track sample, used by an Audio Track.

PNlvl: When ”Perc” is selected as the oscillator type, this parameter adjusts the noise level. For all other oscillator types, this parameter does nothing.
PNtun: When ”Perc” is selected as the oscillator type, this parameter adjusts the noise pitch. For all other oscillator types, this parameter does nothing.

Level: The oscillator output level. Adjusts at what level, the oscillator goes into the filters. At levels above middle, the signal is amplified. At higher levels, saturation might occur.

The following 3 parameters are for the instrument effect. At writing moment, Fuzion only has one instrument effect called ”FAT”, but in future updates, more will be added.

The FAT effect adds up to 4 layers of the sound to itself, and it is possible to adjust the phase of these, and to select whether the effect sound should be boosted or just layered. The input to this effect is taken from the synth’s Amp output, so tweaking the filters will affect this effect.

FAT: Adds 0 to 4 layers of the input sound to itself.

Phase: Adjusts the phase difference of the FAT layers. When turned fully down, all layers are in phase. The more it is turned up, the more the layers goes out of phase to each other. Useful for creating comb filter type sounds.

Boost: When this is on, the FAT layers are sonically added to each other, which will make the sound louder, and might cause it to saturate. If it is off, the sound stays at it’s original sonic level, even when layers are added.

Poly: When this parameter is turned on, the selected synth poly-chains to the synth one number below it. It is possible to polychain more than 2 synths, simply by turning poly on for the next synths in the row. All 8 synths can be poly chained, for 8 notes of polyphony.
This parameter is only present on Synth 2 to 8.

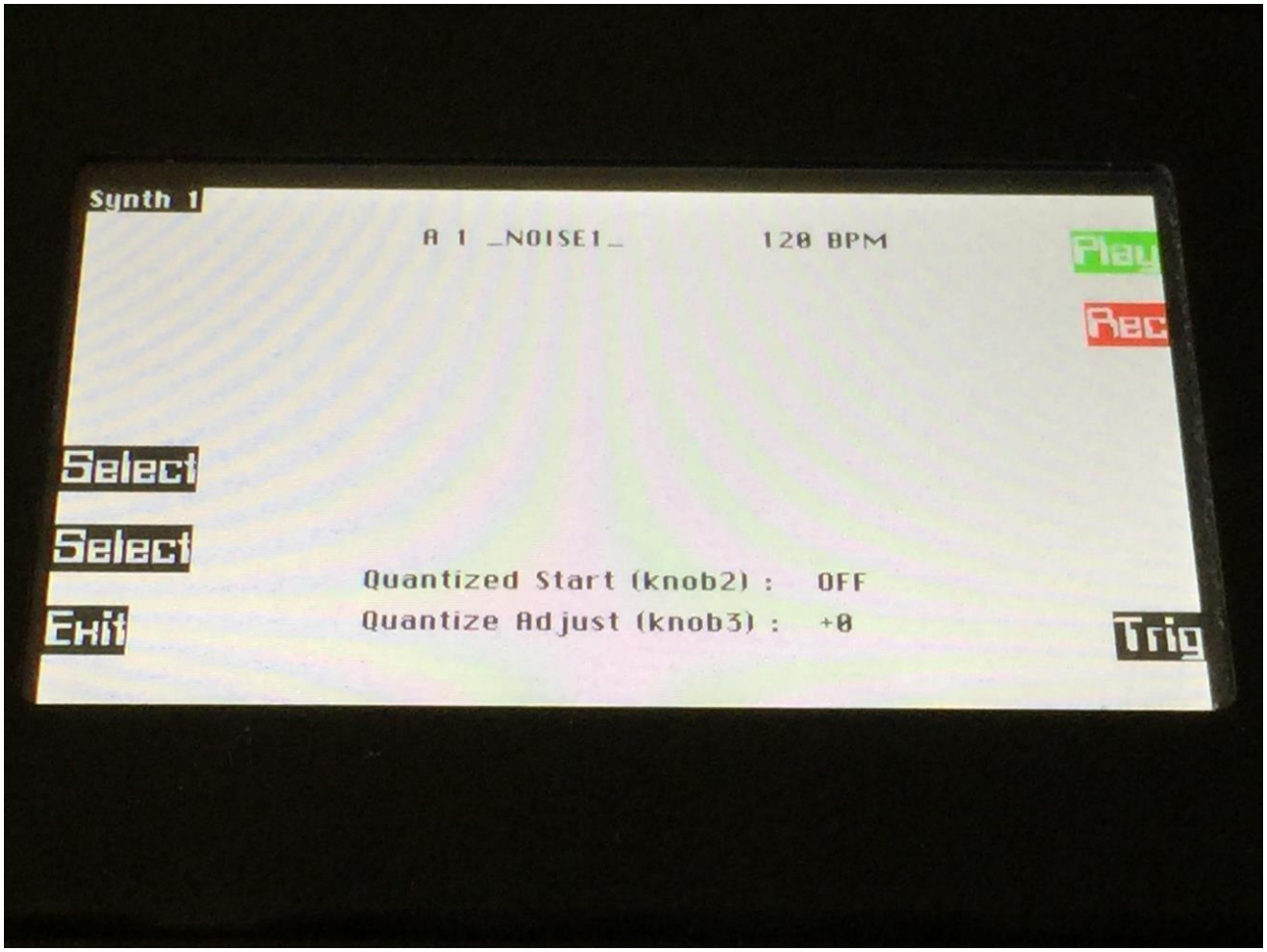
GetSnd: If this parameter is turned on, the poly chained synth will play back with the same sound as the synth it is chained to. If it is off, the synth will play back with its own sound, making it possible to play polyphonic with completely different sounds.
This parameter is only present on Synth 2 to 8.

Efx1: Global effect 1 send level. Adjusts at what level the output of the selected synths instrument effect is sent to global effect 1. At levels above middle, the synth output itself is damped.

Efx2: Global effect 2 send level. Adjusts at what level the output of the selected synths instrument effect is sent to global effect 2. At levels above middle, the synth output itself is damped.

Selecting a sample for the oscillator

If oscillator type is set to ”Sample”, you might want to select which sample, it should play back. To do this, push the ”Sample” button on the oscillator page:



Use the 2 ”Select” buttons to select a sampling. Hold any of them down for fast scroll, and hold both down for really fast scroll. Use edit knob 1 to switch between sample bank A and B.

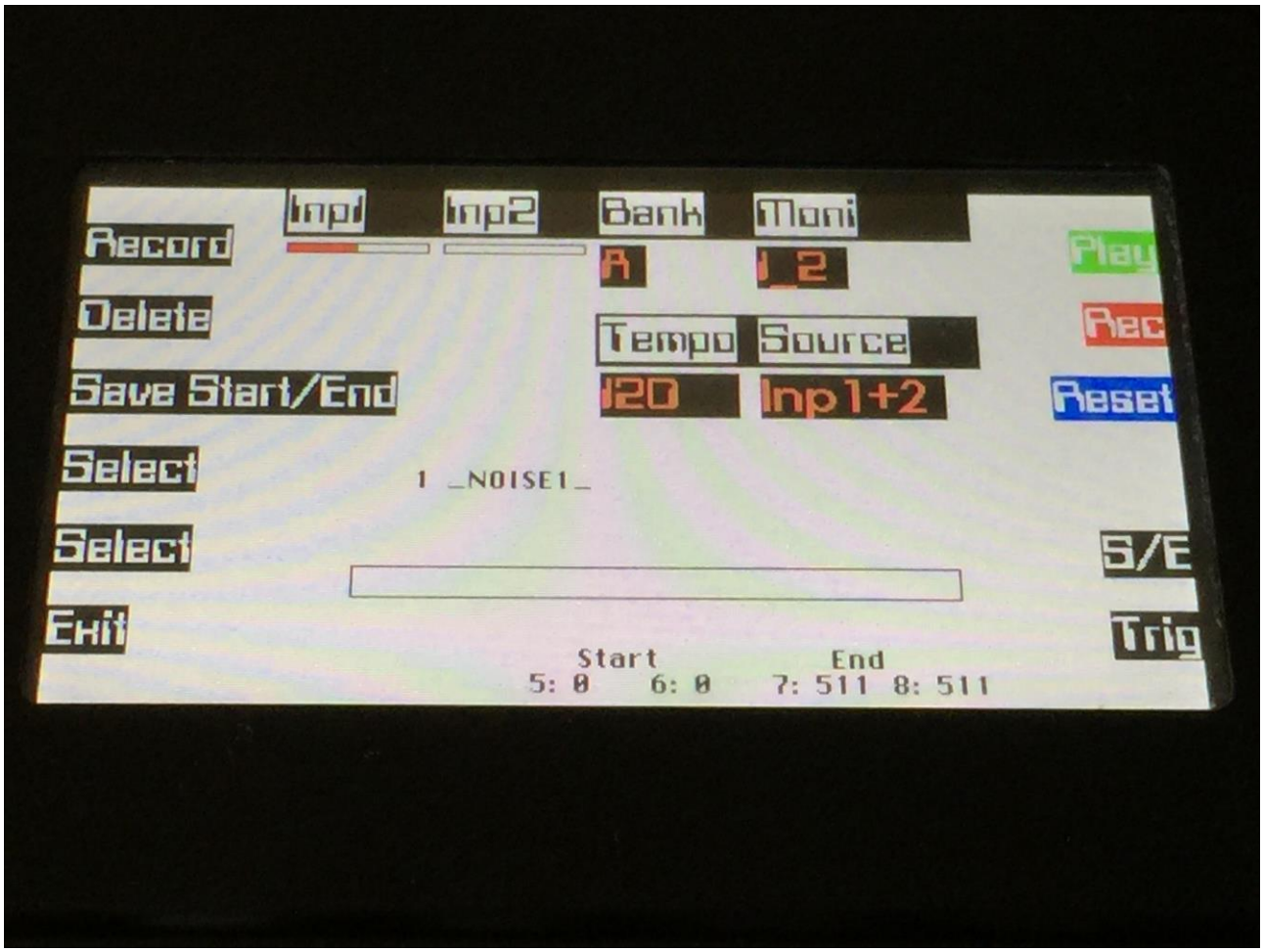
Push the ”Trig” button, play the touch keyboard or a connected MIDI keyboard, to audition.

The Quantized Start and Quantize Adjust parameters are for use with the Sample Remix function, described on the following page.

When you have found the right sampling, push ”Exit” to return to the oscillator page.

Sample Remix

All samples now has a tempo assigned to them. By selecting any sample on the Sample Rec page, its tempo will be shown:



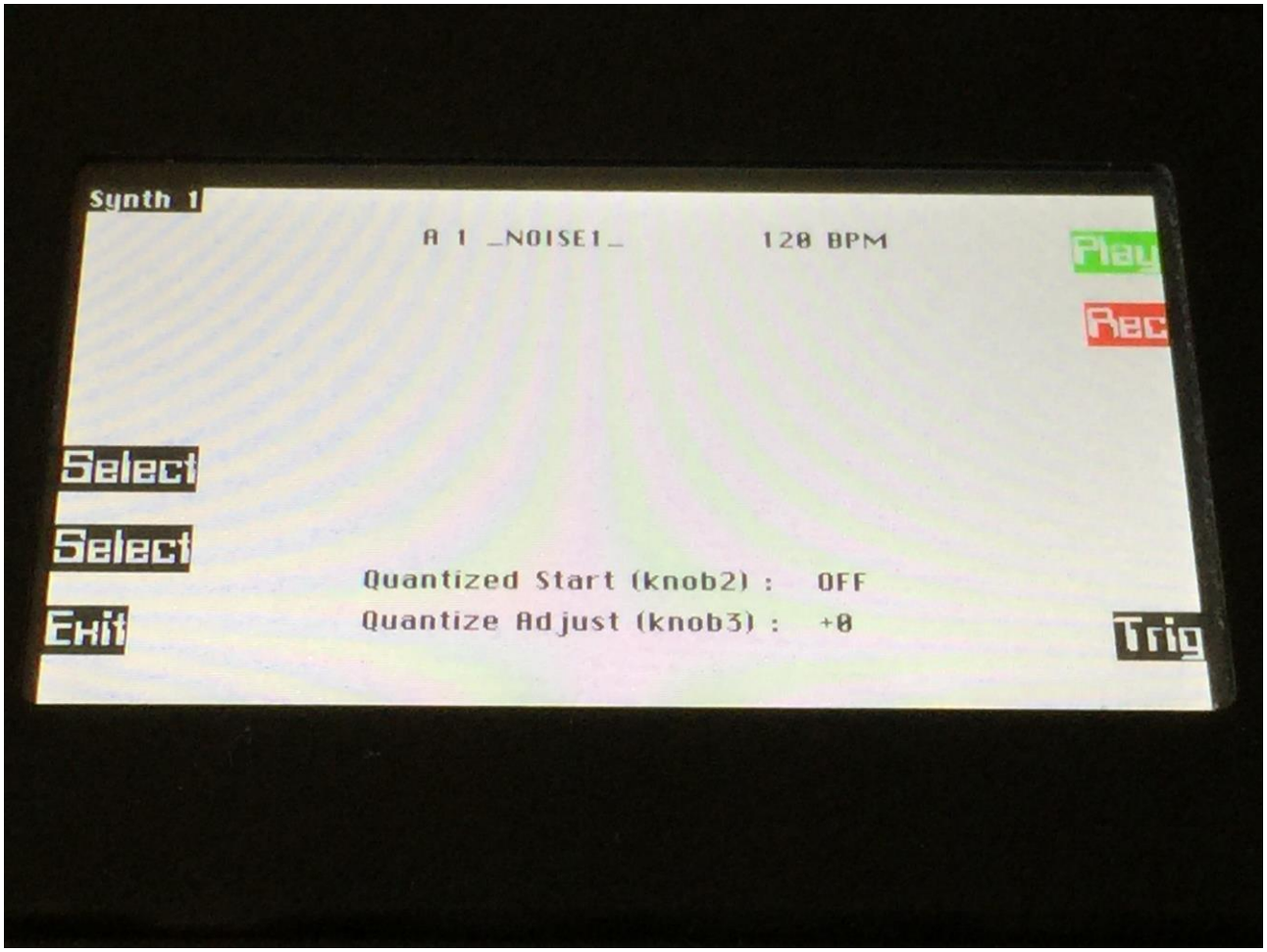
The sample tempo is set to the current sequencer tempo, when recording an audio track. On all other samples, you will have to set the tempo manually, if required. This should be done, if you plan to use a sampling as an audio track, or together with the Quantized Start (remix) function.

To set a samples tempo manually, simply use edit knob 7 to adjust the tempo between 1 and 300 BPM, and the hit the ”Save Start/End” button to save the tempo together with the sampling.

A sample, that has no tempo assigned to it, will be set to 120 BPM.

When a Fuzion sample are exported as a .wav file via USB, the sample tempo are now also exported, so if you import it again, the tempo will be restored.

On the sample select page in the Synth section, 2 parameters are used for the Remix function:



Quantized Start: Values Off, 1/32, 1/24, 1/16, 1/12, 1/8, 1/6, ¼ . When this parameter are at any other setting than Off, the PW/Start parameter will only jump to sample start points, that fits the selected rhythmical value. The sample tempo is used for calculating these points, so to make this function, the sample tempo should be adjusted to fit the actual tempo of the sample.
If a sample with a length of one bar, is quantized into 1/16 notes, this will give 16 start points. If the sample has a length of 2 bars, it will give 32 start points, and so on. The maximum number of possible start points to be selected, is 512. If a sampling has a length, that is caused by your settings to have more than 512 start points, only the first 512 start points will be used.

Quantize Adjust: Values –256 to + 255. Sometimes, if the quantized start points does not fit as they should, this parameter can be used to move the points forwards (+) or backwards (-).

To remix a sample recording

Make sure that Sample is selected as the synth oscillator.

Select the sample, you would like to remix.

Set the Quantized start parameter to t.ex. 1/16.

Set the PW/Start parameter in the middle position.

Set ”Velo” to modulate the PW/Start parameter, turn the amount fully up.

Program a series of 1/16th notes in the sequencer, on note C4 to get the original sample pitch.

Now adjust the velo values of each note, to select specific sample start points.

Adjust the notes, to re-pitch.

Modify the note positions, to change things rhythmically.

Add more variations to your remix, using the Note Randomizer.

All sequencer functions, that can be used on any other sequencer track, can of course also be used on the remix tracks, so please just release your creativity.

Oscillator modulation

At the Osc page, push the ”Mod” button, to enter the modulation page:

For each parameter, that can be modulated, it is possible to select a modulation source, and to adjust the modulation amount. For a complete list of modulation sources, see the list in the start of this section.

The parameters on this page:

Freq Mod 1, Freq Mod 2: Modulates the oscillator pitch.

Wave Mod: Modulates the wave morphing of the Wave oscillator or the sinewave balance of the Perc oscillator.

PW Mod: Modulates the pulse width of the Wave oscillator, the intensity of the Noise oscillator, the start point of the sample oscillator or the sinewave detune of the Perc oscillator.

Level Mod: Modulates the output level of the oscillator.

Pan Mod: Modulates the stereo pan position of the synth output. When source is set to ”Man” (manual), the modulation amount parameter acts as a normal pan position parameter. Output 1 and 2 are paired for panning, and output 3 and 4 are paired for panning.

Phase Mod: Modulates the phase difference of the FAT effect layers.

Filter's parameters

The parameters on the upper half of the screen are for filter 1. The parameters on the lower half of the screen (selected using the "Lowr" button), are for filter 2.

Parameters that are the same for both filters are only explained one time.

Type: Filter 1 / 2 type. Possibilities are:
-LPF: Low pass filter
-BPF: Band pass filter
-BP8: Steep band pass filter
-HPF: High pass filter
-ADD: Reverse filter. Adds harmonics to the sound.
-BEF: Band eliminate filter
-BASS: A filter with most power in the bass area
-LOFI: Agressive low pass filter
-LPF2: Low pass filter 2, with a slightly different response than the first variant
-BPF2: Band pass filter 2, with a slightly different response than the first variant
-BP82: Steep band pass filter 2, with a slightly different response than the first variant
-HPF2: High pass filter 2, with a slightly different response than the first variant

-ADD2: Reverse filter 2, with a slightly different response than the first variant
-BEF2: Band eliminate filter 2, with a slightly different response than the first variant
-BAS2: Bass filter 2, with a slightly different response than the first variant
-LOFI2: Agressive low pass filter 2, with a slightly different response than the first variant
-Peq1: Parametric EQ
-Peq2: Steeper parametric EQ

Cut: Filter 1 / 2 cutoff frequency.

Reso: Filter 1 / 2 resonance setting.

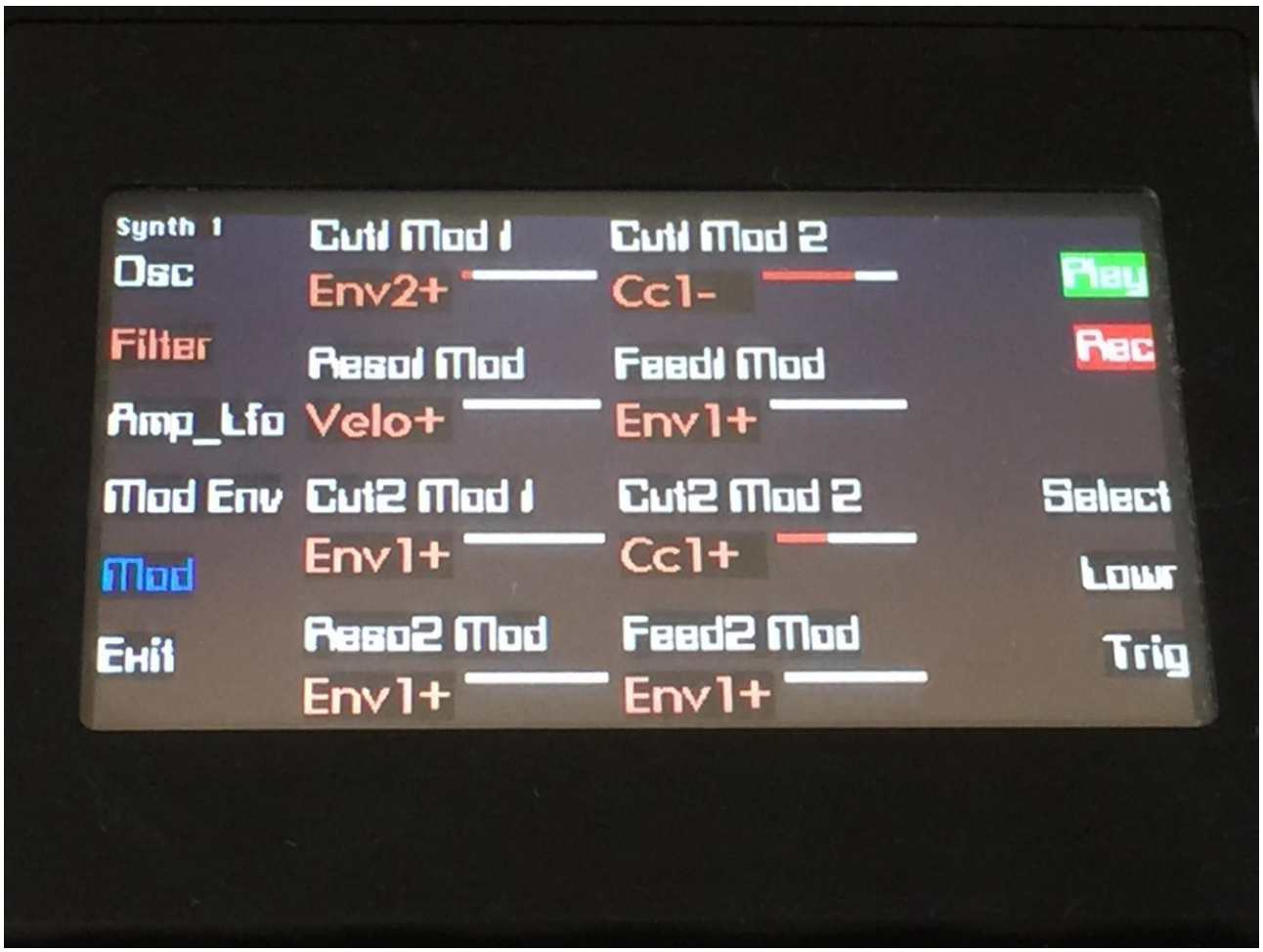
Feed: Filter 1 / 2 feedback amount.

Adj1, Adj2, Adj3: Changes the filter response. For the parametric EQ types, Adj3 acts as cut/boost.

Cobl: Select how the 2 filters should be connected. ”par” for parallel, ”ser” for serial (filter 1 into filter 2).

Output: Select whether the synth should output to audio out 1 and 2, or to audio output 3 and 4.

Filter's modulation



For each parameter, that can be modulated, it is possible to select a modulation source, and to adjust the modulation amount. For a complete list of modulation sources, see the list in the start of this section.

The parameters on this page:

Cut1 Mod 1, Cut1 Mod 2: Modulates the cutoff frequency of filter 1.

Reso1 Mod: Modulates the resonance of filter 1.

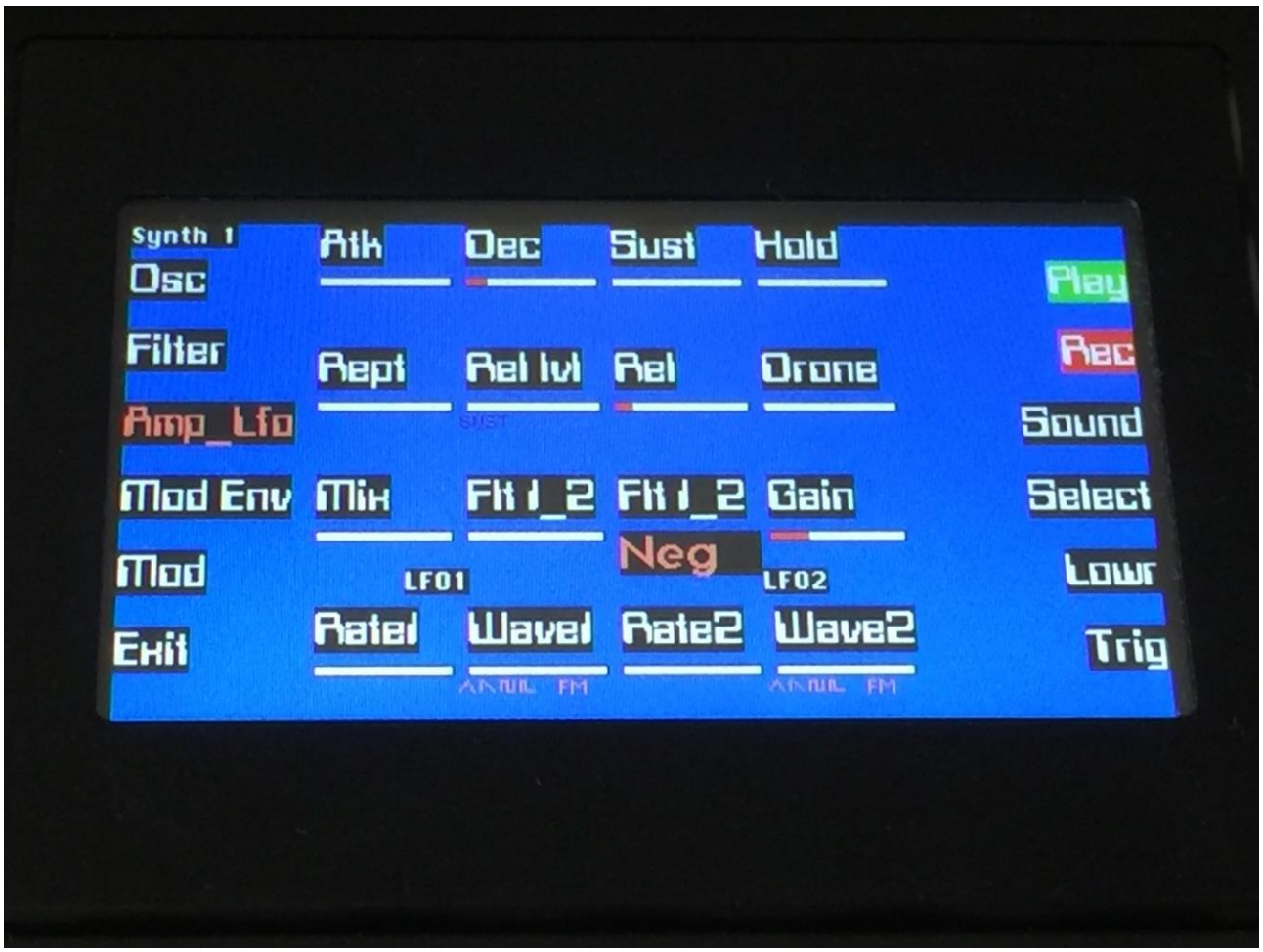
Feed1 Mod: Modulates the feedback amount of filter 1.

Cut2 Mod 1, Cut2 Mod 2: Modulates the cutoff frequency of filter 2.

Reso2 Mod: Modulates the resonance of filter 2.

Feed2 Mod: Modulates the feedback amount of filter 2.

Amp and LFO's parameters



Atk: Amp envelope attack time. The time it will take the amp envelope to rise from zero to its maximum value, when a note event is received and held down.

Dec: Amp envelope decay time. When the amp envelope has reached its maximum value, in the time set by the attack parameter, it will decay, until it reaches the sustain level, and stay there, as long as the note that trigged it is held.

Sust: Amp envelope sustain level. Explained under the "Dec" parameter.

Hold: Amp envelope note hold time. If this parameter is turned fully down, it has no function. If it is turned up, it will simulate a note that is held down, for the adjusted amount of time, regardless of when, the note that triggered the envelope is released. It will always make the envelope run through the attack time, the decay time and the release time, at least one time. The length of the hold time, adjusts how long the envelope should stay at the sustain level. If the next parameter (Rept – Repeats) is turned up, the hold function will run the attack and decay sequence, for the number of times adjusted by rept. The hold parameter can be really useful for t.ex. drum sounds, where you want the sound to have the exact same length, every time it is trigged.

Rept: Amp envelope attack/decay repeats. Adjusts the number of times, the attack/decay sequence should be repeated. From 1 to 8 times. If you put attack to zero, set a very short decay time, and set this parameter at a middle value (4 to 5 repeats), you got yourself a handclap envelope.

Rel lvl: Amp envelope release level. If this is turned fully down, the amp envelope will release form whatever level it is at, when a note off event are received. When it is turned up, the amp envelope will jump to the adjusted level, when a note off event are received, and release from that.

Rel: Amp envelope release time. The time it will take the amp envelope to decay from the value it is at, when a note off event are received, to zero.

Drone: Amp envelope drone offset level. When this is turned up, the amp envelope will never reach an output value, lower than what this is adjusted to –It will release to this adjusted value, instead of zero. Use this to keep the output of the synth open for drone sounds, or for external input sounds.

Mix: Mix balance between the filter outputs, and the un-filtered oscillator signal. When this is turned fully down, only the output from the 2 filters goes to the amp. When it is turned fully up, only the clean oscillator signal goes to the amp.

Flt 1_2: Filter 1 / 2 mix. When the 2 filters are connected in parallel, this adjusts the mix balance between them. When this is turned fully down, only filter 1 can be heard, and when turned fully up, only filter 2 can be heard.

Flt 1_2 (2): Select if the mix between the 2 filters should be normal (Pos) or inverted (Neg). When the filters are mixed together inverted, they will remove harmonics from each other, and that can sometimes give some really interesting results.

Gain: Amp output level. At settings higher than middle, the amp output will be gained.

Rate1, Rate2: LFO 1 and 2 rate. Adjusts the speed of the LFO's.

Wave1, Wave2: LFO 1 and 2 output waveform. Morphs between triangle, sawtooth, square, pulse and FM waveforms. The FM waveforms are high frequency waves, that can be used for FM synthesis of oscillator, filters and amp.

Amp and LFO's modulation

For each parameter, that can be modulated, it is possible to select a modulation source, and to adjust the modulation amount. For a complete list of modulation sources, see the list in the start of this section.

The parameters on this page:

Atk Mod: Modulates the amp envelope attack time.

Dec Mod: Modulates the amp envelope decay time.

Rel Mod: Modulates the amp envelope release time.

Amount Mod: Modulates the amp envelope output level.

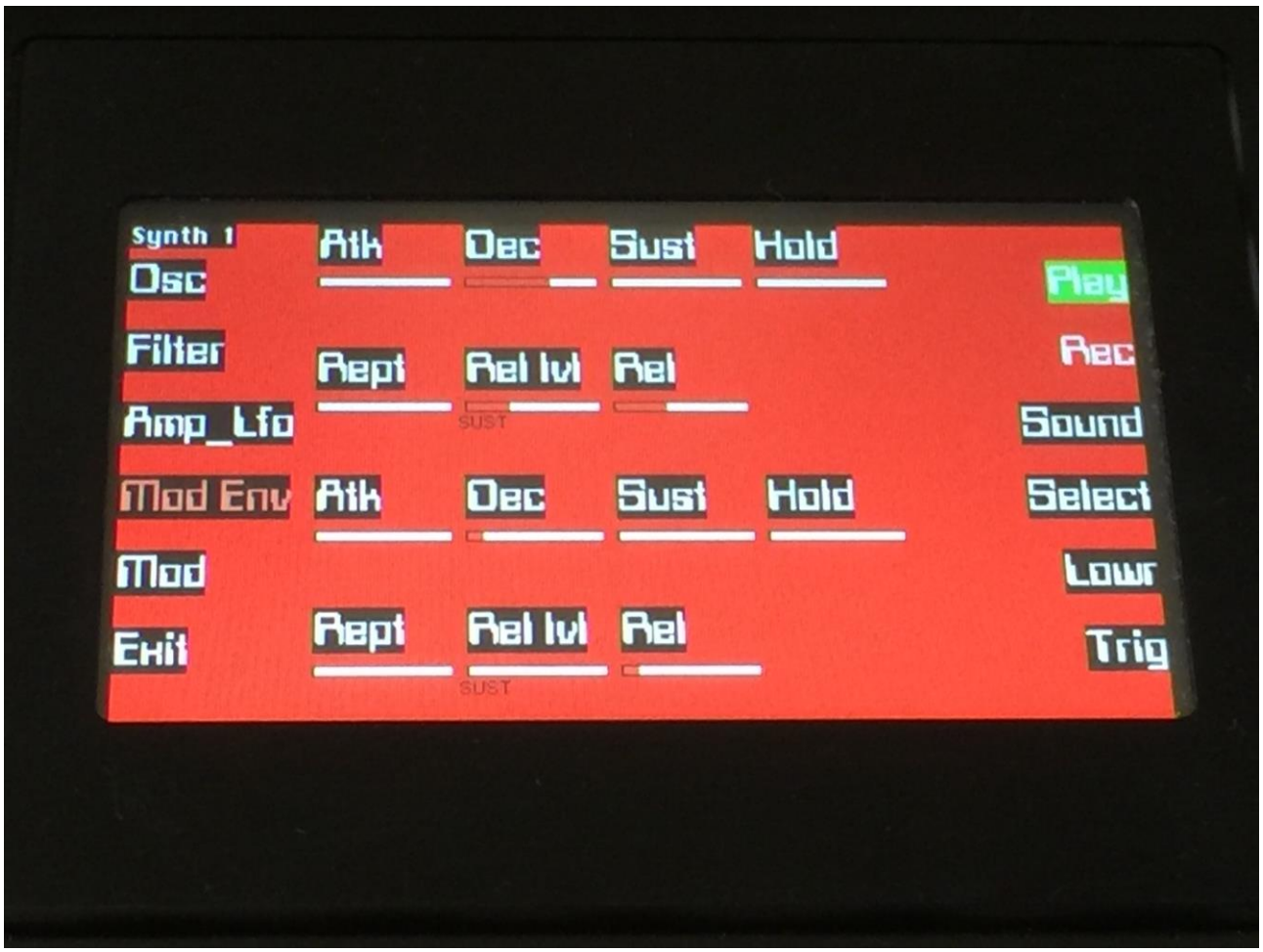
Mix Mod: Modulates the mix between the fiters outputs and the un-filtered oscillator.

Flt1 / 2 Mod: Modulates the mix between filter 1 and 2.

Gain Mod: Modulates the amp output level.

Rate1 Mod: Modulates the rate of LFO1.

Modulation envelope's parameters



Since the parameters are the same for modulation envelope 1 and 2, each are only explained one time. The parameters on the upper half of the screen are for modulation envelope 1, and the parameters on the lower half of the screen (Lowr selected), is for modulation envelope 2.

Atk: Mod envelope attack time. The time it will take the mod envelope to rise from zero to its maximum value, when a note event is received and held down.

Dec: Mod envelope decay time. When the mod envelope has reached its maximum value, in the time set by the attack parameter, it will decay, until it reaches the sustain level, and stay there, as long as the note that trigged it is held.

Sust: Mod envelope sustain level. Explained under the "Dec" parameter.

Hold: Mod envelope note hold time. If this parameter is turned fully down, it has no function. If it is turned up, it will simulate a note that is held down, for the adjusted amount of time, regardless of when, the note that triggered the envelope is released. It will always make the envelope run through the attack time, the decay time and the release time, at least one time. The length of the hold time, adjusts how long the envelope should stay at the sustain level. If the next parameter (Rept –

Repeats) is turned up, the hold function will run the attack and decay sequence, for the number of times adjusted by rept. The hold parameter can be really useful for t.ex. drum sounds, where you want the sound to have the exact same length, every time it is trigged.

Rept: Mod envelope attack/decay repeats. Adjusts the number of times, the attack/decay sequence should be repeated. From 1 to 8 times. If you put attack to zero, set a very short decay time, and set this parameter at a middle value (4 to 5 repeats), you got yourself a handclap envelope.

Rel lvl: Mod envelope release level. If this is turned fully down, the mod envelope will release form whatever level it is at, when a note off event are received. When it is turned up, the mod envelope will jump to the adjusted level, when a note off event are received, and release from that.

Rel: Mod envelope release time. The time it will take the mod envelope to decay from the value it is at, when a note off event are received, to zero.

Modulation envelope's modulation

For each parameter, that can be modulated, it is possible to select a modulation source, and to adjust the modulation amount. For a complete list of modulation sources, see the list in the start of this section.

The parameters on this page:

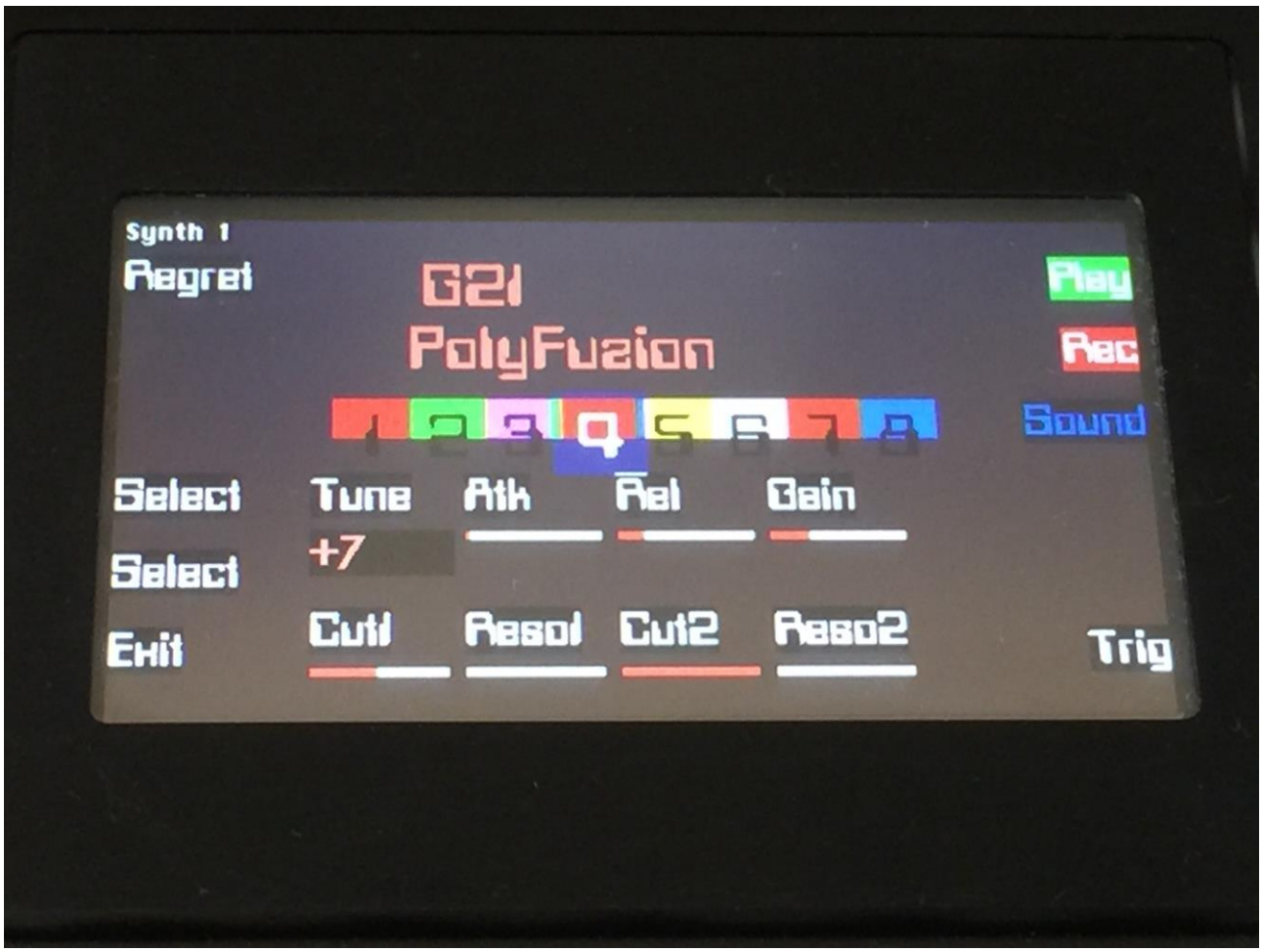
Atk1 Mod, Atk2 Mod: Modulates the mod envelope 1 / 2 attack time.

Dec1 Mod, Dec2 Mod: Modulates the mod envelope 1 / 2 decay time.

Rel1 Mod, Rel2 Mod: Modulates the mod envelope 1 / 2 release time.

Amount1 Mod, Amount2 Mod: Modulates the mod envelope 1 / 2 output level.

The Sound Finder



When creating a new preset, you might not want to create all the sounds from scratch. Therefore a Sound Finder was implemented. Using this, you can scrool through and audiotion all the sounds in any preset, and quick edit the sounds right away.

To enter the Sound Finder, from any other synth page than the oscillator page, push the ”Sound” button.

Use the 2 ”Select” buttons to select the sound. Hold any of them down for fast scroll, and hold both down for really fast scroll. The name and the number of the preset you are auditioning sounds from, are shown in the upper part of the screen, and the synth number is shown by inverting any of the 8 numbers right under the preset name. It is only possible to select synths, that has a sound that differs from the initial sound, so you will not have to go through a lot of initial sounds, if you have not programmed all 8 synths in a preset.

To audition the sound, push the ”Trig” button, or simply play it by the touch keyboard or a connected MIDI keyboard. If a sequence is programmed for this synth, this will immediately play back with the sound you have found.

Experiment immediately by quick editing the sound, using the 8 edit knobs. Quick edit parameters are:
Tune: The oscillator pitch.

Atk: The amp envelope attack.

Rel: The amp envelope release.

Gain: The amp output level.

Cut1: Filter 1 cutoff frequency.

Reso1: Filter 1 resonance.

Cut2: Filter 2 cutoff frequency.

Reso2: Filter 2 resonance.

To keep the sound that you have found/quick edited, just push the ”Exit” button, to return to the synth edit pages. Here you can, of course, tweak the sound further, using all the synth parameters.

If you did not find what you wanted, and just wants to keep the sound that was on this synth, before you entered the Sound Finder, push the ”Regret” button. You will now return to the synth edit pages, and the original sound of this synth will be restored.

The 2 Global Effects Processor’s

Fuzion has 2 global effects processors, that the signals from the 8 synths can be sent through. Each synth has separately adjustable sends for effect 1 and 2.

At writing moment, only 3 different effect types can be selected for these, but more will be added in future updates. These are Delay, Reverb and Granulator. Only effect 1 can have Reverb selected.

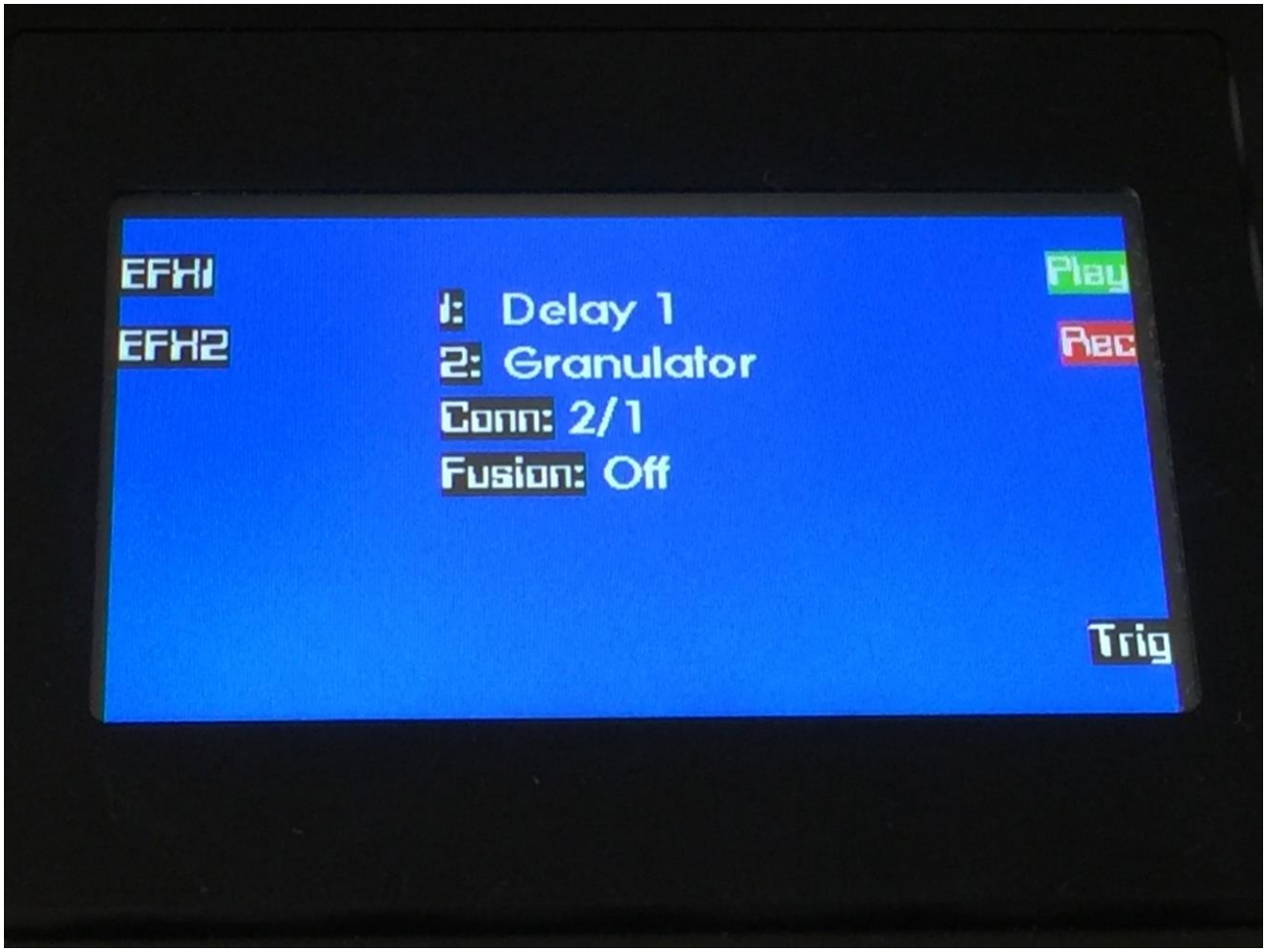
The output of the effects will right now only go to audio out 1 and 2, but this might be changed in a future update.

Remember to save all edits you do in the effects. Else they will be lost when you change preset, or turn Fuzion off. See how to in the ”Save Preset” section.

From the Preset select screen, push the ”EFX” button, to enter the effects pages. The first page you will face, should look something like this:

From this page, push the ”EFX Select” button, to set up the effects.

The effects select page:



The parameters on this page (use the edit knobs to adjust):

1: Effects processor 1 effect select. Choices are at the moment:
-Delay 1
-Reverb 1
-Granulator

2: Effects processor 2 effect select. Choices are at the moment:
-Delay 1
-Granulator

Conn: Effects connection:
-2 / 1 : The 2 processors are connected as 2 separate effects.
-2>1 : The output of effect 2 goes into effect 1.

Fusion: Effects fusion. When this is off, the 2 effects will run completely independent of each other, using their own separate memory. When this is on, the 2 processors will use the same memory space, fusioning together. This can create some really odd effects.

To exit the effect select page, push the ”EFX1” button if you would like to edit the parameters of effect 1, or the ”EFX2” button, if you would like to edit the parameters of effect 2.

Effect 1 parameters

Delay 1

Delay 1 are a single tap delay with granular parameters (size and beam), and with adjustable crossfade, direction and depth of the delay box. The maximum delay time is 45 seconds.

Parameters:

Level: The output level of the effect.

TimeGr: Delay time group, which is the largest unit in adjusting the delay time.

Time: Delay time.

Fine: Delay time fine adjust.

Feed: Delay feedback amount. At values over middle, the feedback signal will be gained and create infinite feedback. This might cause some saturation.

With ”Lowr” selected:

Size: A granular parameter. The more this is turned up, the less space of the delay box is used, causing some echo’s to repeat, and others not to sound at all.

Xfade: Crossfade. Makes the delay effect sound smoother, by crossfading the feedback repeats into each other.

Mode: Crossfade mode:
-Norm : Normal crossfade mode. The repeats crossfades into ech other.
-Duck : Ducked croosfade mode. One repeat fades out, before the next one fades in.

Dir: Delay playback direction:
-Fwd : Forwards.
-Bwd : Backwards

Beam: A granular parameter, that ”beams” some of the delay sound grains to another place.

Deep: Simulates a delay box, with adjustable depth.

The buttons:

Bypass: This will bypass the selected effect, and pass the audio signal through unaffected.

Freeze: When this is active, the selected effect stops sampling the input signal applied to it, and only plays back the content that is already sampled to its buffer.

Reverb 1

A FAT high resolution synthesized reverb with granular Size parameter.

Parameters:

Level: The output level of the effect.

With ”Lowr” selected:

Time: Reverb time. The total reverb time is a combination of time, timeX, feed and feedX.

Fine: Reverb time fine adjust.

Time X: Adjusts how much the following reverb taps will decrease in time. Lower settings is good for a short reverb, and higher settings for a long reverb.

Size: A granular parameter. The more this is turned up, the less space of the reverb box is used, causing some echo’s to repeat, and others not to sound at all.

Feed: Reverb feedback.

Feed X: Adjusts how much the following reverb taps will decrease in feedback. Lower settings gives a delay effect. As this is turned up, it goes over in a metallic reverb type, and at higher settings it gives a more full reverb.

Dir: Reverb playback direction:
-Fwd : Forwards.
-Bwd : Backwards

The buttons:

Bypass: This will bypass the selected effect, and pass the audio signal through unaffected.

Freeze: When this is active, the selected effect stops sampling the input signal applied to it, and only plays back the content that is already sampled to its buffer.

Granulator

This effect records the input signal to a buffer and cuts this up into fragments, which sizes depends on both the Time and the Fragments (number of fragments) parameters. It is then possible to rearrange the order of these fragments, and to re-pitch or time-stretch them, using two 16-step granulator sequencers, to get something completely new out of the input signal.

Parameters:

Level: The output level of the effect.

Steps: Sets how many steps the granulator sequencers should go through, until they starts over again from step one. Values: 1 to 16.

Fragments: Adjusts how many fragments (grains) the recorded input signal should be cutted up in, when played back. Values: 1, 2, 4, 8, 16, 32, 64, 128.

With ”Lowr” selected:

TimeGr: Granulator time group, which is the largest unit in adjusting the granulator time.

Time: This parameter plus TimeGr adjust the total size of the Granulator record and play buffer – How long time it will record the input signal, until it starts over again.

Fine: Fine adjustment of the Time parameter.

Feed: Adjusts how much of the Granulator output signal should be fed back to its input.

Xfade: Adjusts how much ducking crossfade that will be added between the granulator sequencer steps.

Mode: Sets the playback mode of the second granulator sequencer:
-pitc: The second granulator sequencer will re-pitch the playback.
-strc: The second granulator sequencer will time stretch the playback.

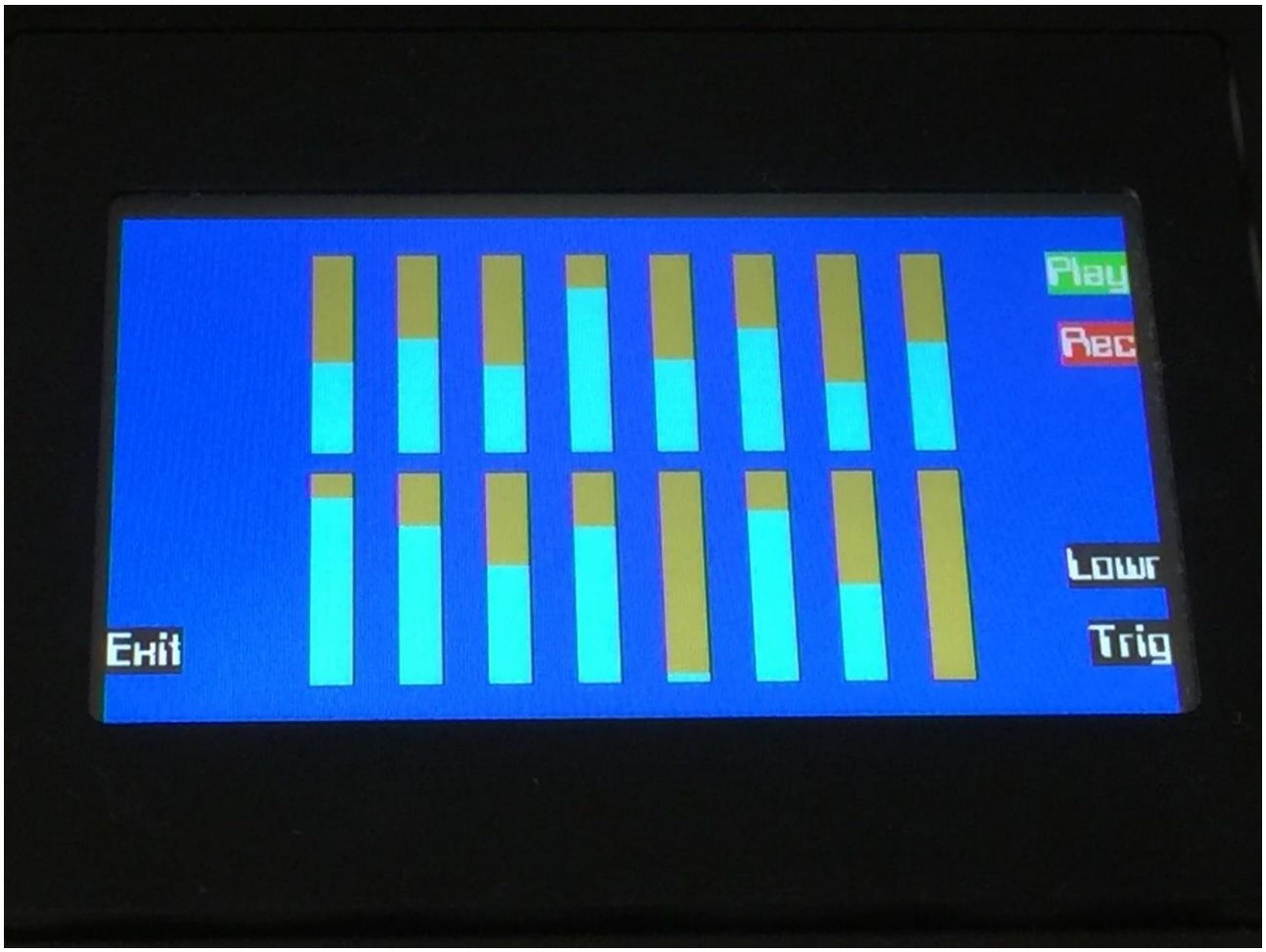
Dir: Sets the playback direction of the Granulator output, which can either be forwards (fwd) or backwards (bwd).

The buttons:

Bypass: This will bypass the selected effect, and pass the audio signal through unaffected.

Freeze: When this is active, the selected effect stops sampling the input signal applied to it, and only plays back the content that is already sampled to its buffer.

To edit the order in which the granulator fragments are played back, push the ”Steps” button to enter the step edit page:



Use edit knob 1 to 8, to adjust which fragment of the sound buffer, that should be played back at each step of the granulator sequencer.

Push the “Lowr” button to switch between editing the upper and lower row.

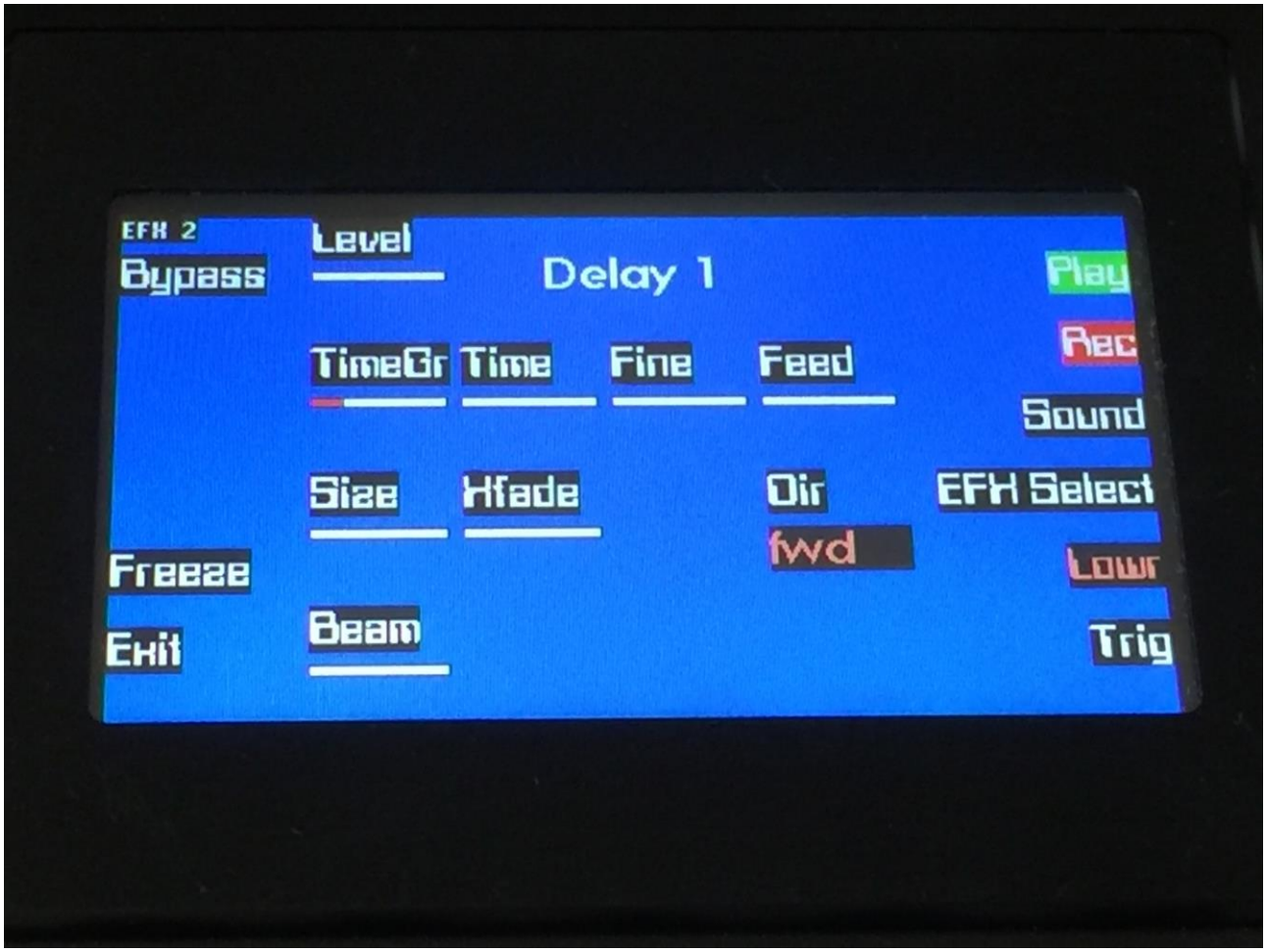
To edit the pitch change or timestretch amount for each step of the granulator sequencer, push the ”Pitch” button to enter the pitch edit page:

Use edit knob 1 to 8, to adjust the pitch change or timestretch amount for each step of the granulator sequencer.

Push the “Lowr” button to switch between editing the upper and lower row.

Effect 2 parameters

Delay 1



Delay 1 are a single tap delay with granular parameters (size and beam), and with adjustable crossfade and direction. The maximum delay time is 45 seconds.

Parameters:

Level: The output level of the effect.

TimeGr: Delay time group, which is the largest unit in adjusting the delay time.

Time: Delay time.

Fine: Delay time fine adjust.

Feed: Delay feedback amount. At values over middle, the feedback signal will be gained and create infinite feedback. This might cause some saturation.

With ”Lowr” selected:

Size: A granular parameter. The more this is turned up, the less space of the delay box is used, causing some echo’s to repeat, and others not to sound at all.

Xfade: Ducked Crossfade. Makes the delay effect sound smoother, by crossfading the feedback repeats into each other.

Dir: Delay playback direction:
-Fwd : Forwards.
-Bwd : Backwards

Beam: A granular parameter, that ”beams” some of the delay sound grains to another place.

The buttons:

Bypass: This will bypass the selected effect, and pass the audio signal through unaffected.

Freeze: When this is active, the selected effect stops sampling the input signal applied to it, and only plays back the content that is already sampled to its buffer.

Granulator

This effect records the input signal to a buffer and cuts this up into fragments, which sizes depends on both the Time and the Fragments (number of fragments) parameters. It is then possible to rearrange the order of these fragments, and to re-pitch or time-stretch them, using two 16-step granulator sequencers, to get something completely new out of the input signal.

Parameters:

Level: The output level of the effect.

Steps: Sets how many steps the granulator sequencers should go through, until they starts over again from step one. Values: 1 to 16.

Fragments: Adjusts how many fragments (grains) the recorded input signal should be cutted up in, when played back. Values: 1, 2, 4, 8, 16, 32, 64, 128.

With ”Lowr” selected:

TimeGr: Granulator time group, which is the largest unit in adjusting the granulator time.

Time: This parameter plus TimeGr adjust the total size of the Granulator record and play buffer – How long time it will record the input signal, until it starts over again.

Fine: Fine adjustment of the Time parameter.

Feed: Adjusts how much of the Granulator output signal should be fed back to its input.

Xfade: Adjusts how much ducking crossfade that will be added between the granulator sequencer steps.

Mode: Sets the playback mode of the second granulator sequencer:
-pitc: The second granulator sequencer will re-pitch the playback.
-strc: The second granulator sequencer will time stretch the playback.

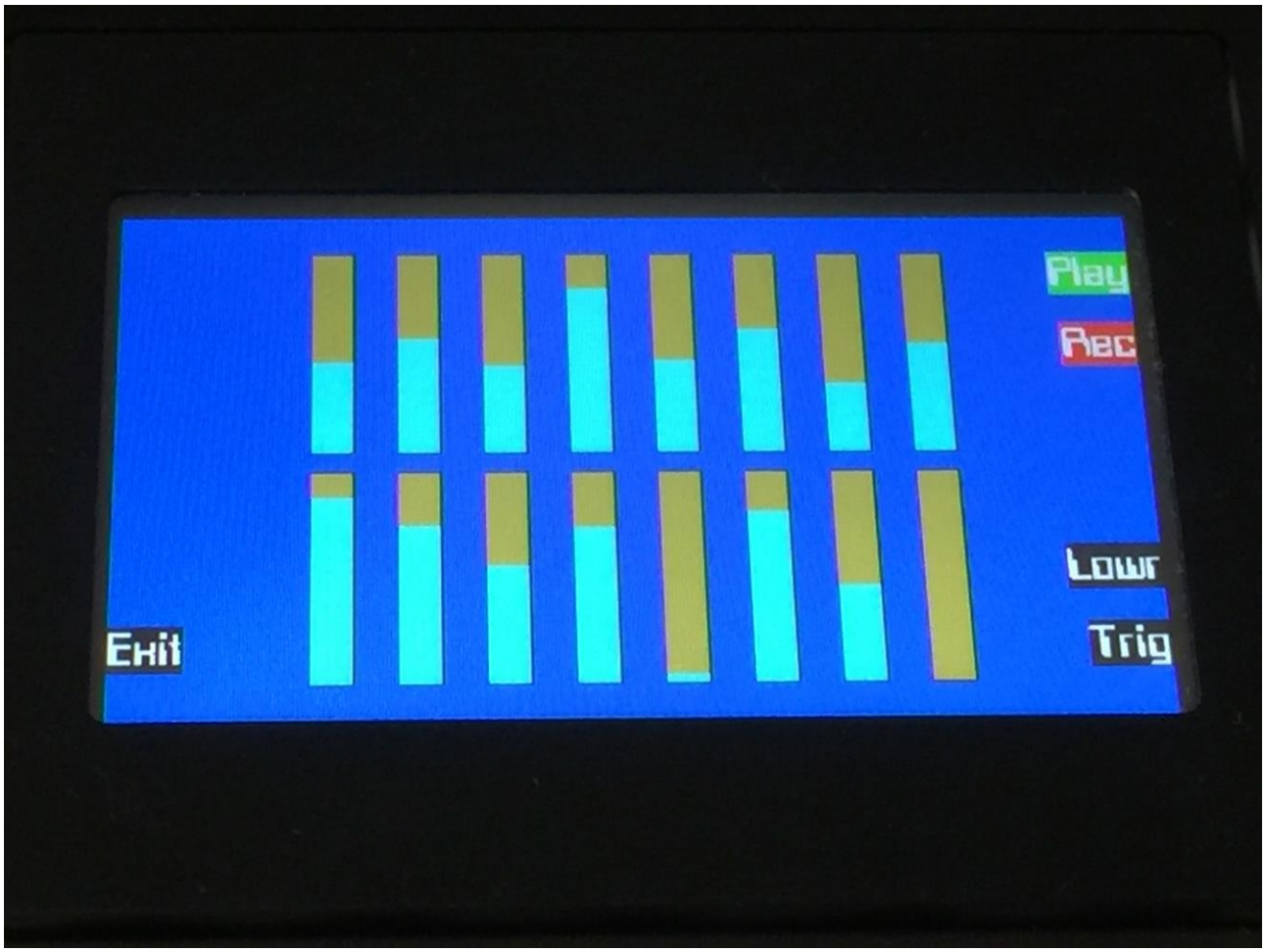
Dir: Sets the playback direction of the Granulator output, which can either be forwards (fwd) or backwards (bwd).

The buttons:

Bypass: This will bypass the selected effect, and pass the audio signal through unaffected.

Freeze: When this is active, the selected effect stops sampling the input signal applied to it, and only plays back the content that is already sampled to its buffer.

To edit the order in which the granulator fragments are played back, push the ”Steps” button to enter the step edit page:



Use edit knob 1 to 8, to adjust which fragment of the sound buffer, that should be played back at each step of the granulator sequencer.

Push the “Lowr” button to switch between editing the upper and lower row.

To edit the pitch change or timestretch amount for each step of the granulator sequencer, push the ”Pitch” button to enter the pitch edit page:

Use edit knob 1 to 8, to adjust the pitch change or timestretch amount for each step of the granulator sequencer.

Push the “Lowr” button to switch between editing the upper and lower row.

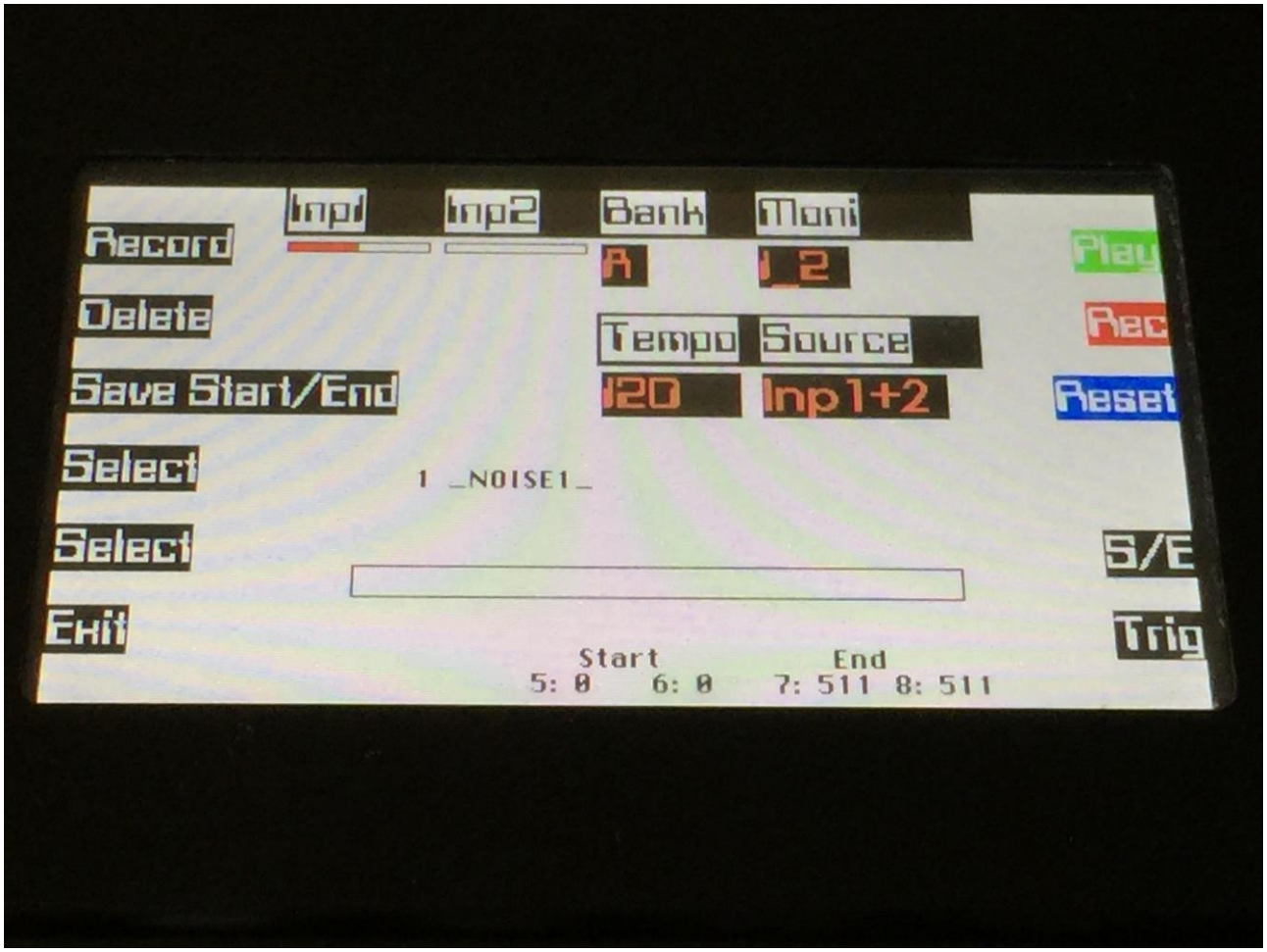
Sample Record

To get samples into Fuzion, for using in the synths or as audio tracks, when oscillator mode is sample or AuTrk, you can either import .wav files from a USB drive, or record your own samples from Fuzion's 2 audio inputs. This section will describe the latter. For how to import .wav files, please see the USB section of this manual.

Fuzion has 2 banks of FLASH memory for storing samples, Bank A and Bank B. Bank A holds up to 100 minutes of samples, maximum 2048, and Bank B holds up to 200 minutes of samples, maximum 4096 – A total of 6144 samples/300 minutes.

All samples that are imported or recorded, stays in Fuzion's FLASH memory, even after a power off. Since they are played back directy from the FLASH, there are no loading times. All Fuzion's samples are immediately available, right after power on, and can be selected in the synth oscillator section, just like synth waveforms.

From the Preset select screen, push the ”Sample Rec” button, to enter the sample record page:



On this page you can audition samples, adjust the audio input levels, switch input monitoring on and off, select sample bank for import and recording, record and delete samples, select the sample recording source, set the tempo of a sample, and adjust a samples start and end point.

To audition the samples on your Fuzion, use the ”Select” buttons to select the sample you would like to audition. Hold one of these down for fast scroll, and hold both for really fast scroll. The sample number and are shown in the middle of the screen. To audition the selected sample, push the ”Trig” button.

Use edit knob 3, to switch between sample Bank A and B.

While auditioning a sample, the sample VU-meter right under the sample name, show the volumes of the sample.

If you apply an audio signal to Fuzion’s audio inputs, this VU-meter will show the volume of the applied signal(s).

By adjusting the ”Moni” parameter with edit knob 4, you can switch monitoring of audio input 1 and 2 on and off. When monitoring are on for any of the inputs, the audio signals applied to these, are sent directly to Fuzion’s audio outputs 1 and 2. When you record a sample, you will probably need to have monitoring on, unless you need to avoid some feedback in your audio chain. When using the audio inputs as oscillators in the synth section, you should switch monitoring off, in order to avoid having both the clean and the sythesized inputs at the same time.

Settings:

-Off: Monitoring of both input 1 and 2 are off. No audio input signals will be sent to audio out 1 and 2.
-1: Audio input 1 will be sent to audio out 1 and 2. Input 2 will not.
-2: Audio input 2 will be sent to audio out 1 and 2. Input 1 will not.
-1_2: Both audio in 1 and 2 will be sent to audio out 1 and 2.

Recording a sample

Select the source, you would like to sample record, by adjusting the ”Source” parameter, using edit knob 8. Choices are:
Inp 1+2: Audio In 1 and 2 mixed.
Inp 1: Audio In 1 only.
Inp 2: Audio In 2 only.
Outp 1: Whatever is present on Audio Out 1.
Outp 2: Whatever is present on Audio Out 2.
Outp 3: Whatever is present on Audio Out 3.
Outp 4: Whatever is present on Audio Out 4.

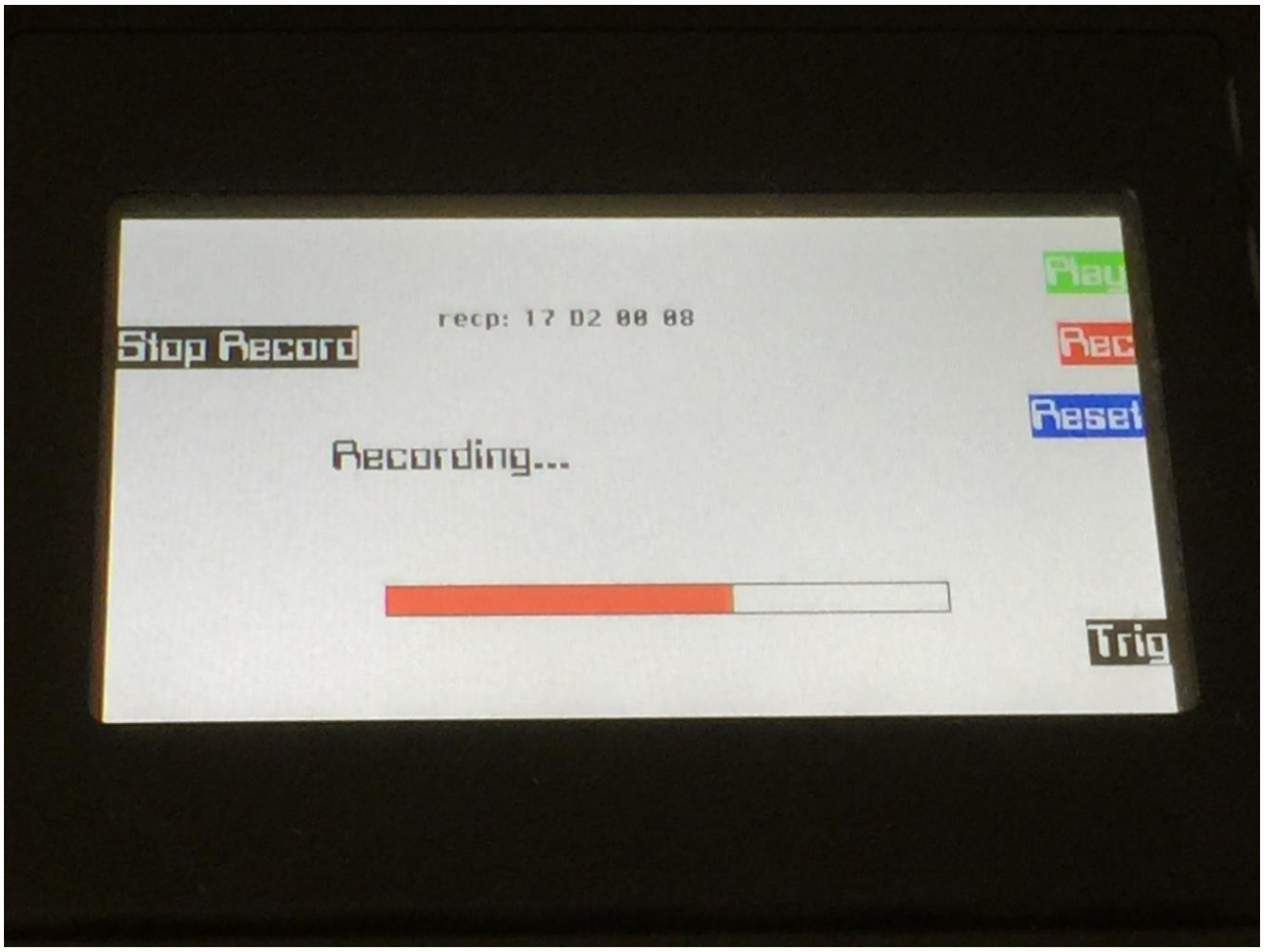
If you selects any of the audio outputs, please skip the next sections, on adjusting the levels.

If you selects any of the audio inputs, adjust the input level (Inp1 or Inp2), depending on what audio input you would like to sample, to a middle value, using edit knob 1 or 2. Turn the input level of the other input fully down.

Apply the signal, that you wold like to sample. Watch the VU-meter. Adjust the output level of the sample source (if possible), so the VU-meter is not standing too much in the upper (right) region of it.

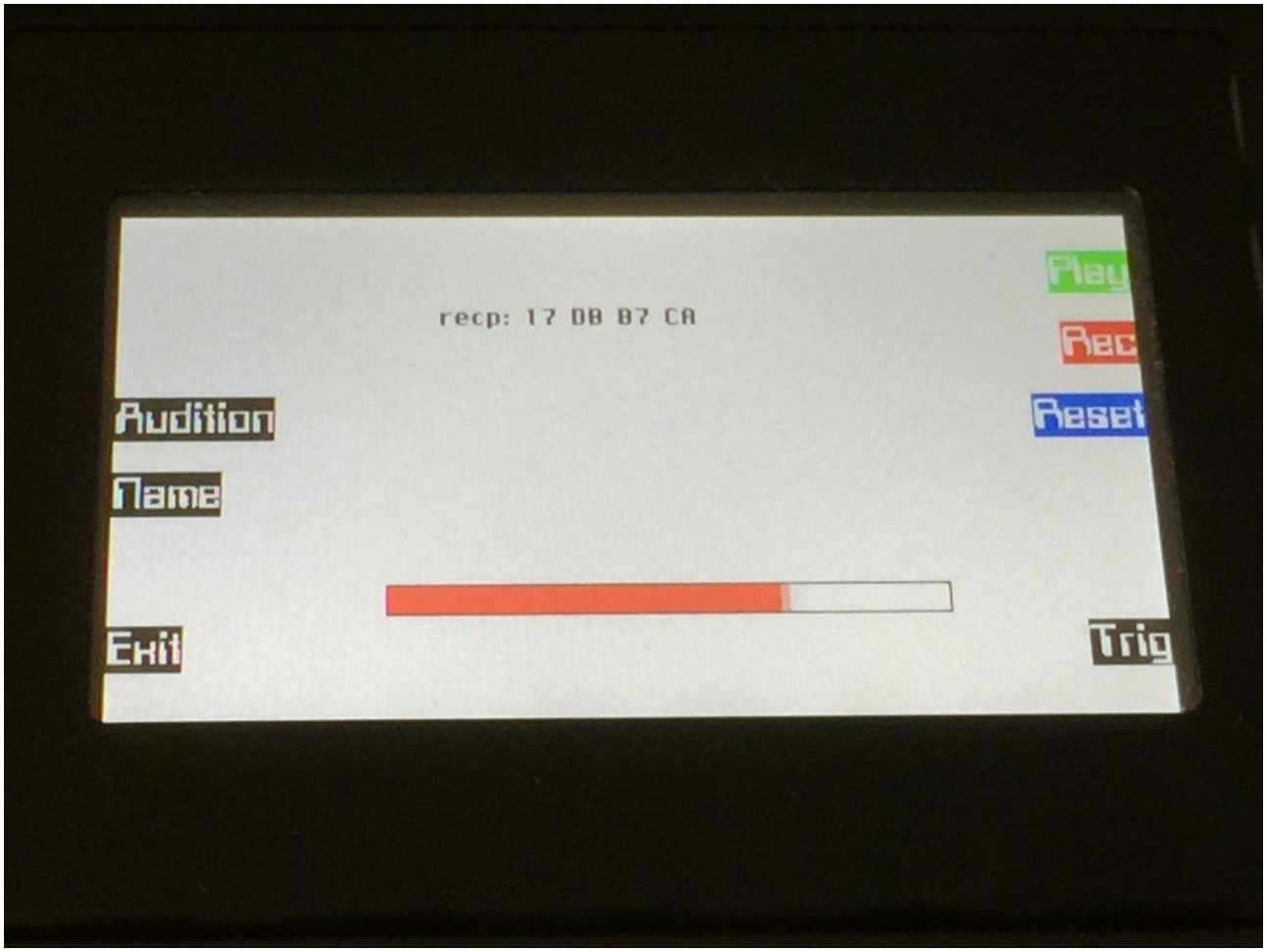
You will get the best results, by having Fuzion’s input level in the middle position, and adjust the level of the sample source, on the source itself. You should only adjust Fuzion’s input level parameters, if it is the only possibility you have, or if the source is too weak.

When you are ready to record the sample, push the ”Record” button in the upper left corner. Fuzion will now start to record the new sample:



When you are finished recording your sample, push the ”Stop Record” button.

Fuzion will now jump to this screen:



To audition the sample you have just recorded, push the ”Audition” button.

To name and save the sample, push the ”Name” button.

If you would not like to keep this sample, push the ”Exit” button, and the new sample will be erased.

When pushing the ”Name” button, Fuzion will jump to this page:

Here you can use edit knob 1 to 8, to select the first 8 characters of the new sample’s name.

When you have done that, push the ”Next” button, to enter the last 8 characters of the sample name.

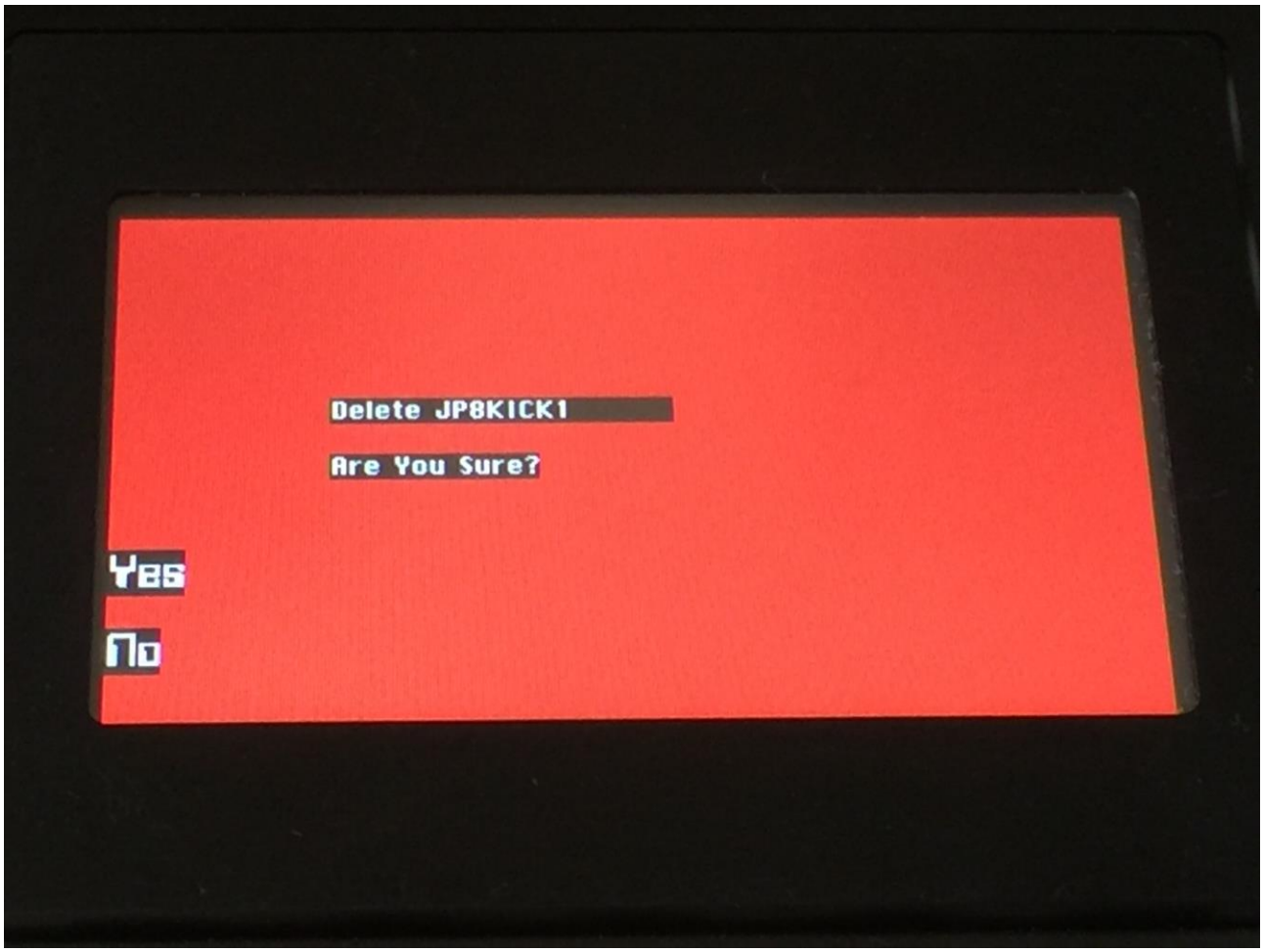
Use edit knob 1 to 8, to select the last 8 characters of the new sample’s name.

When you have done that, push the ”Save” button, to save the new sample, and return to the Sample Rec page.

Deleting a sample

On the Sample Rec page, select the sample, you would like to delete.

Push the ”Delete” button. Fuzion will now ask, if you are sure:

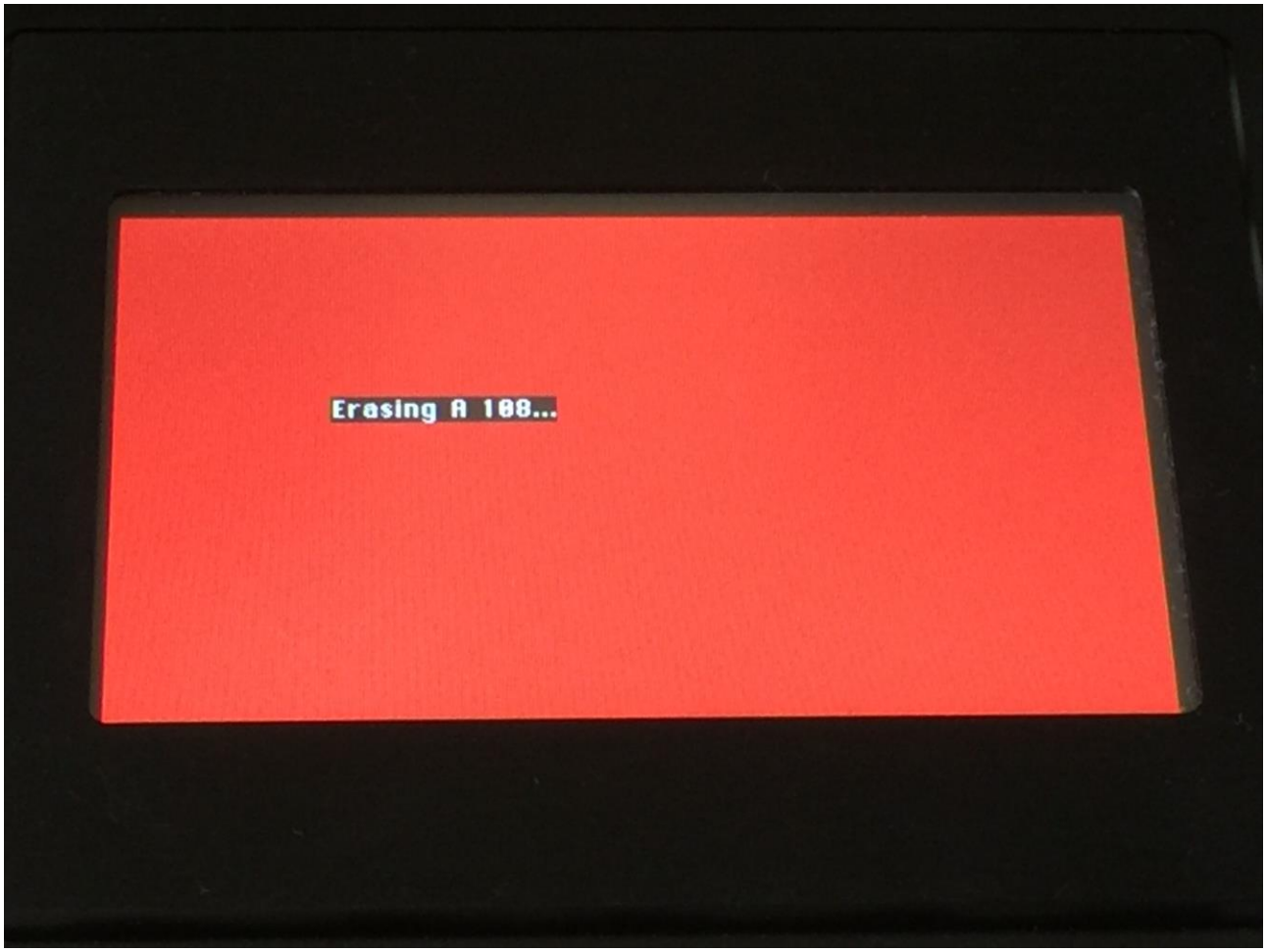


To delete the sample, push ”Yes”.

If you regret, push ”No”, to return to the Sample Rec page.

If you pushed ”Yes”, it will now delete the selected sample.

If this was not the highest numbered sample in a bank, it will copy all higher numbered samples one place down. It will also modify the sample numbers used in the presets, so it might take some time.



Adjusting the start and end points of a sample

If a sample has silence at the start and/or end of it, or if there are parts of a sample you do not intend to use, it might be nescessary to adjust the start and end points of it.

To do this, select the sample you would like to adjust.

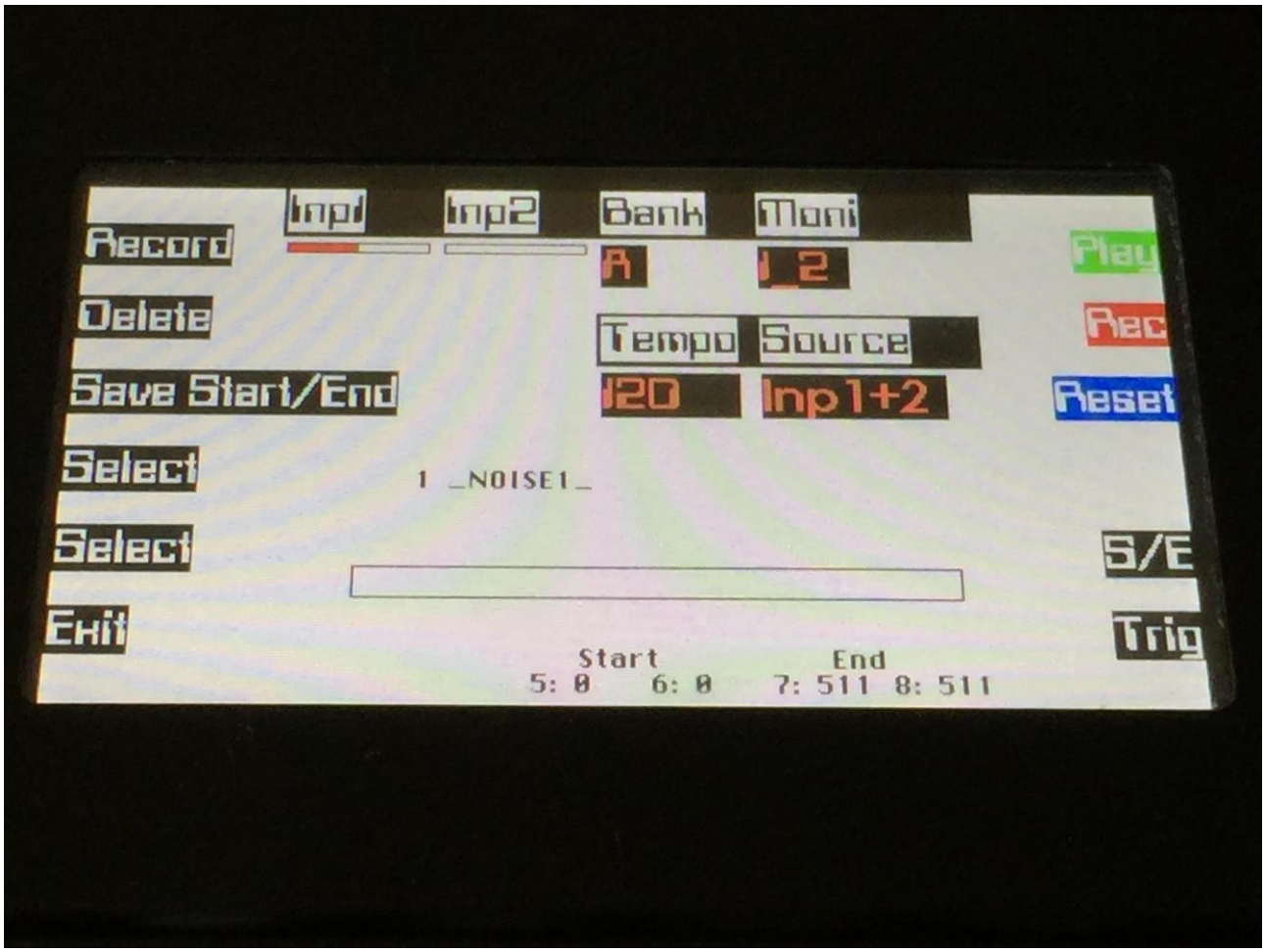
Push the ”S/E” button, to select the Start and End parameters.

Adjust the start point using edit knob 5, fine adjust using edit knob 6.

Adjust the end point using edit knob 7, fine adjust using edit knob 8.

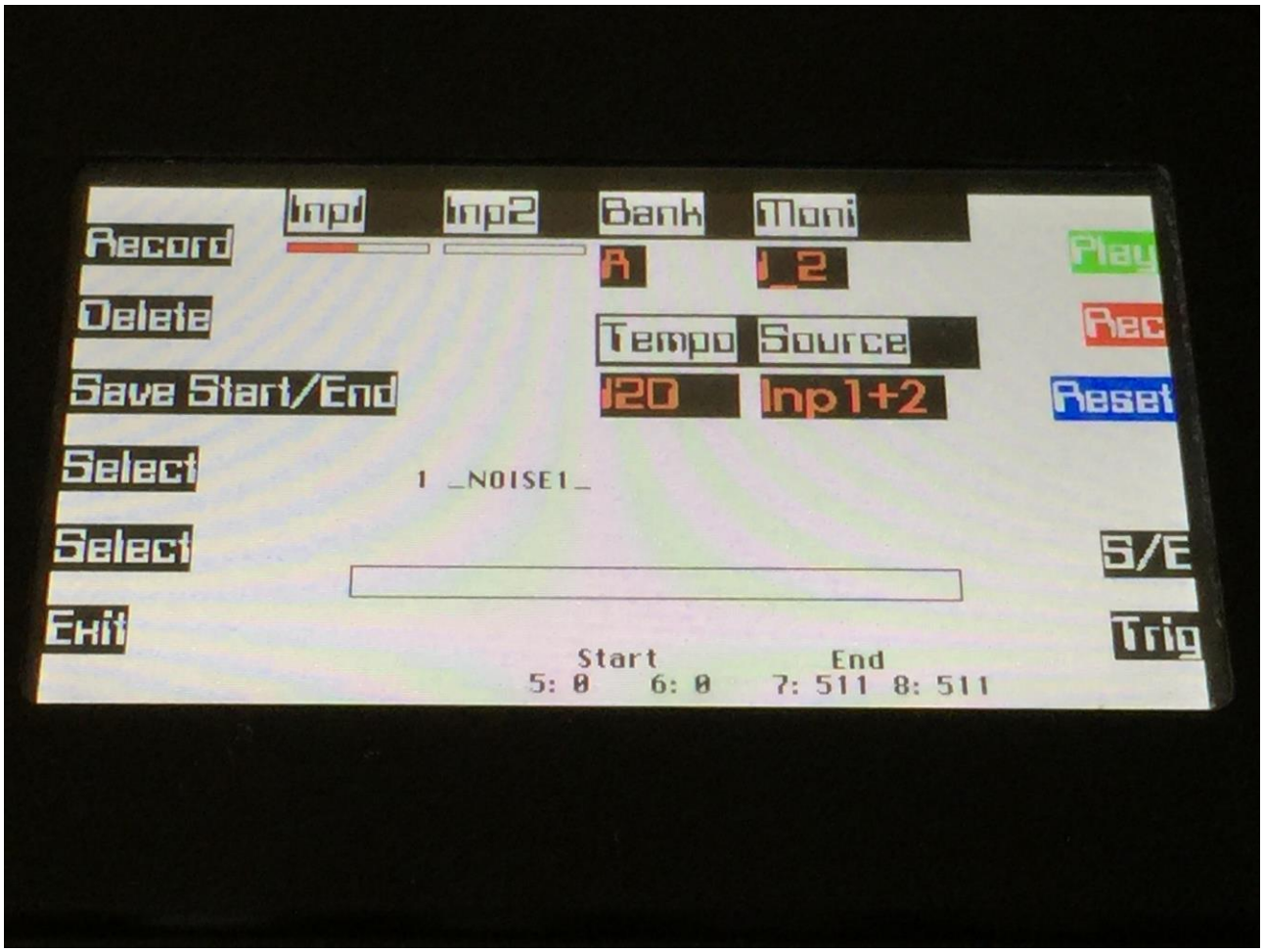
Audition using the ”Trig” button.

When you are satisfied with the result, push the ”Save Start/End” button.



Sample Tempo Adjust

All sample has a tempo assigned to them. By selecting any sample on the Sample Rec page, its tempo will be shown:



The sample tempo is set to the current sequencer tempo, when recording an audio track. On all other samples, you will have to set the tempo manually, if required. This should be done, if you plan to use a sampling as an audio track, or together with the Quantized Start (remix) function.

To set a samples tempo manually, simply use edit knob 7 to adjust the tempo between 1 and 300 BPM, and the hit the ”Save Start/End” button to save the tempo together with the sampling.

A sample, that has no tempo assigned to it, will be set to 120 BPM.

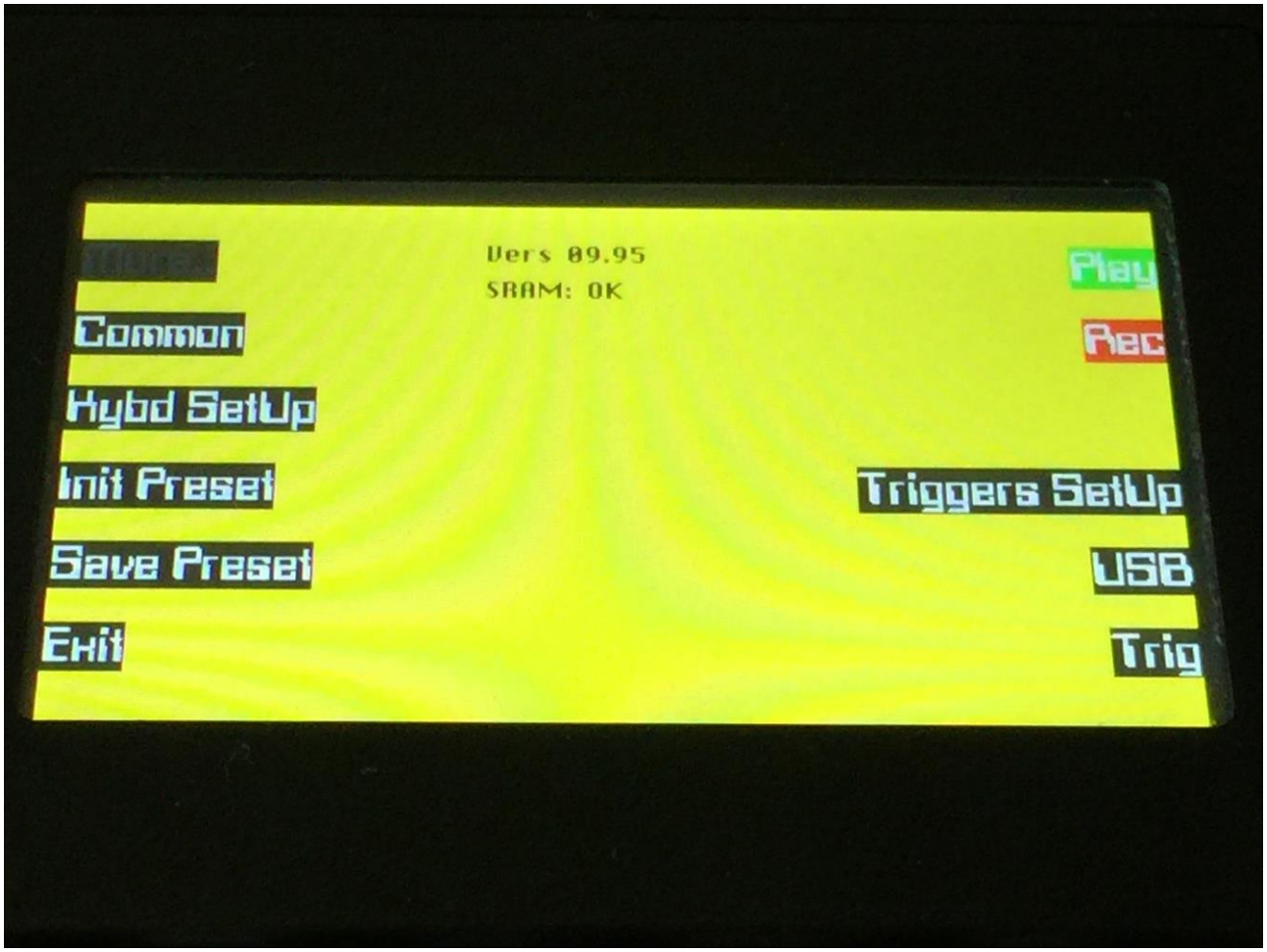
When a Fuzion sample are exported as a .wav file via USB, the sample tempo are now also exported, so if you import it again, the tempo will be restored.

Save Preset

When you have created a new preset, it should be saved for later recall. If you do not save your presets, they will be lost forever, as soon as you select another preset.

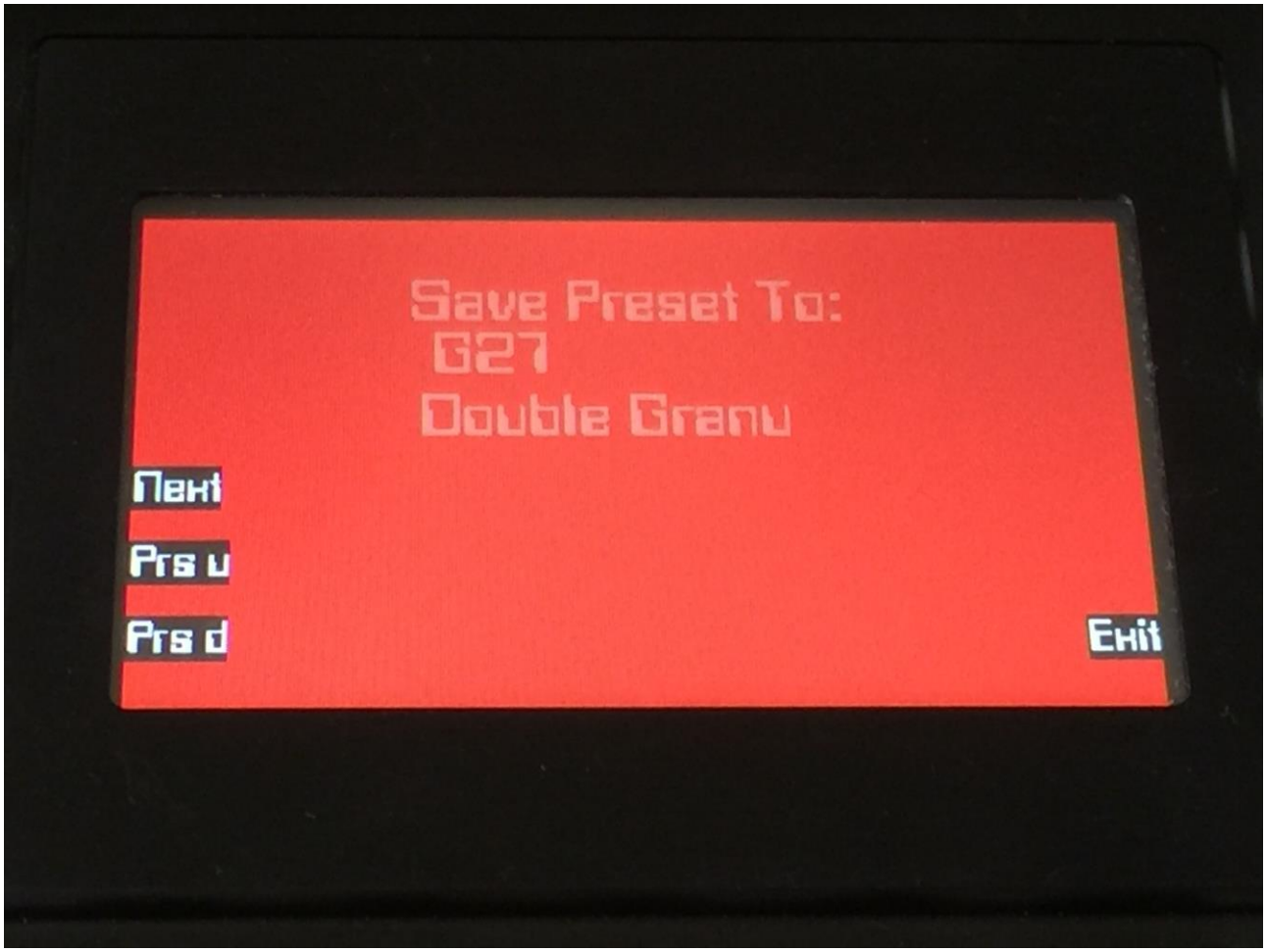
A preset that is saved on Fuzion contains:
-All sequencer data
-The settings for the 8 synthesizers
-The settings for the 2 effects processors

From the Preset Select screen, push the ”More..” button, to enter this page:



From this page, push the ”Save Preset” button.

You should now enter this page:



Use the ”Prs u” and ”Prs d” buttons, to select the preset location, on which you would like to save your new preset. Holding one of these buttons down, will scroll through the preset locations. Holding both down, will scroll fast through the locations. Preset number and name is shown for presets that are already saved. If you save your new preset on such a location, the old preset will be overwritten. On preset locations, where a preset has not yet been saved, the name will be shown as ”<empty>”.

Push the ”Next” button, when you have found the right location.

Use edit knob 1 to 8 to select the first 8 letters of the name for your new preset.

Press ”Next” when you are done.

Use edit knob 1 to 8 to select the last 8 letters of the name for your new preset.

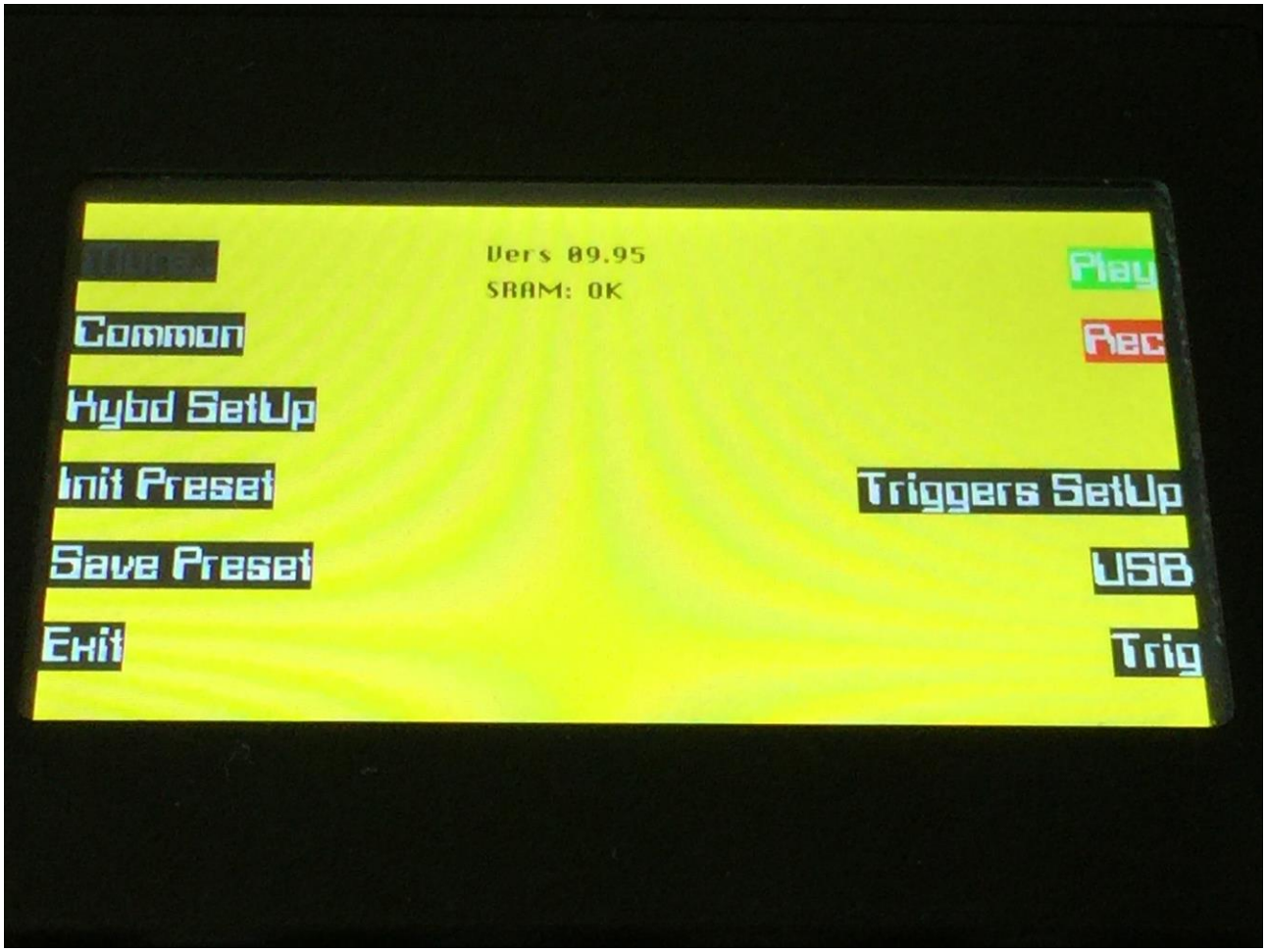
Press ”Save” when you are done. Your preset will now be saved, and Fuzion will exit from the save pages.

Initialize Preset

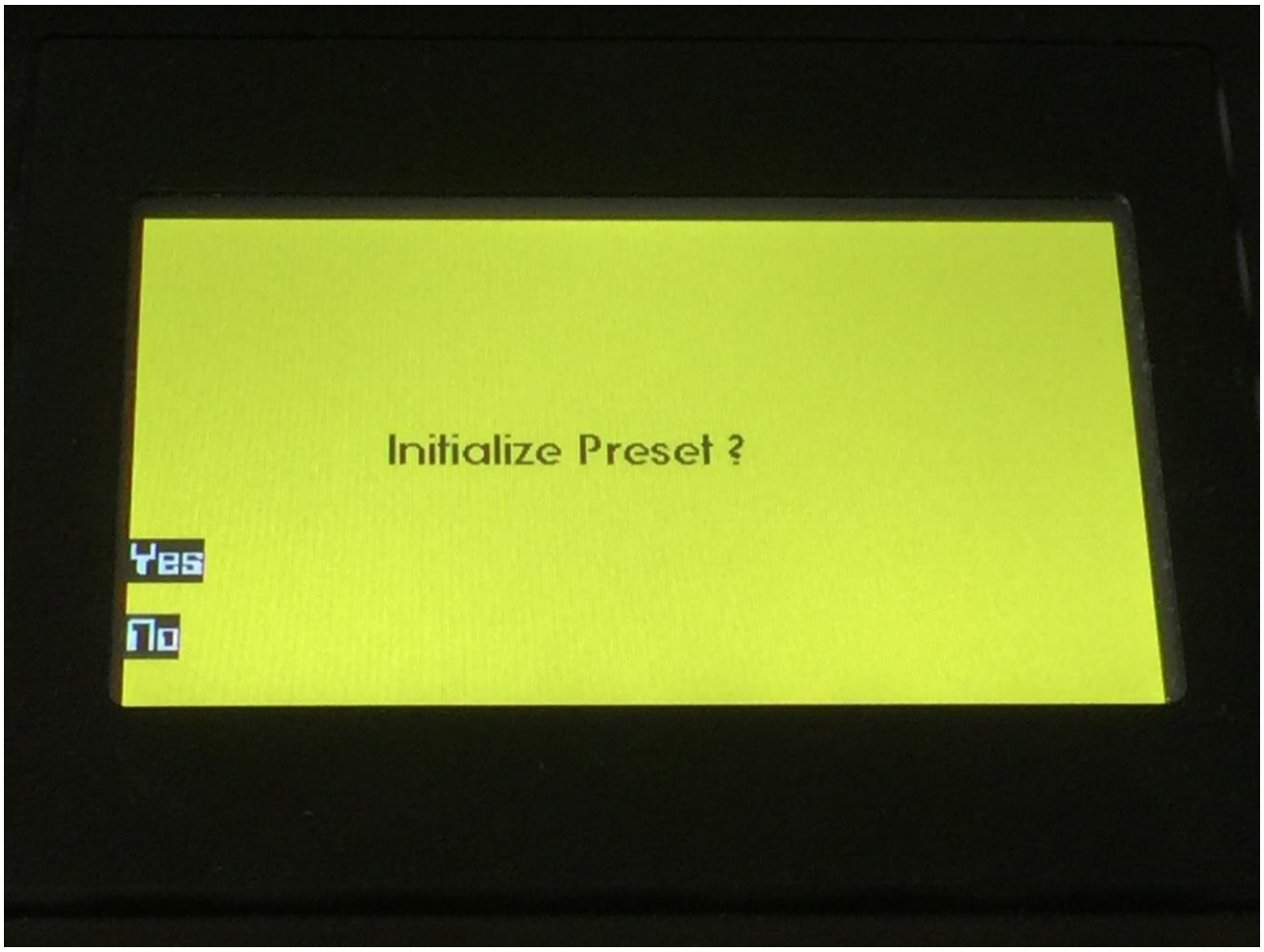
If you would like to start out from scratch, with a completely clean preset, this is the function to use.

Please notice that the preset on the selected location are not immediately wiped out. It will not be overwritten until you save the new preset, so even though you have initialized it, it can still be recalled, if you should regret.

From the Preset Select screen, push the ”More..” button, to enter this page:



Push the ”Init Preset” button.



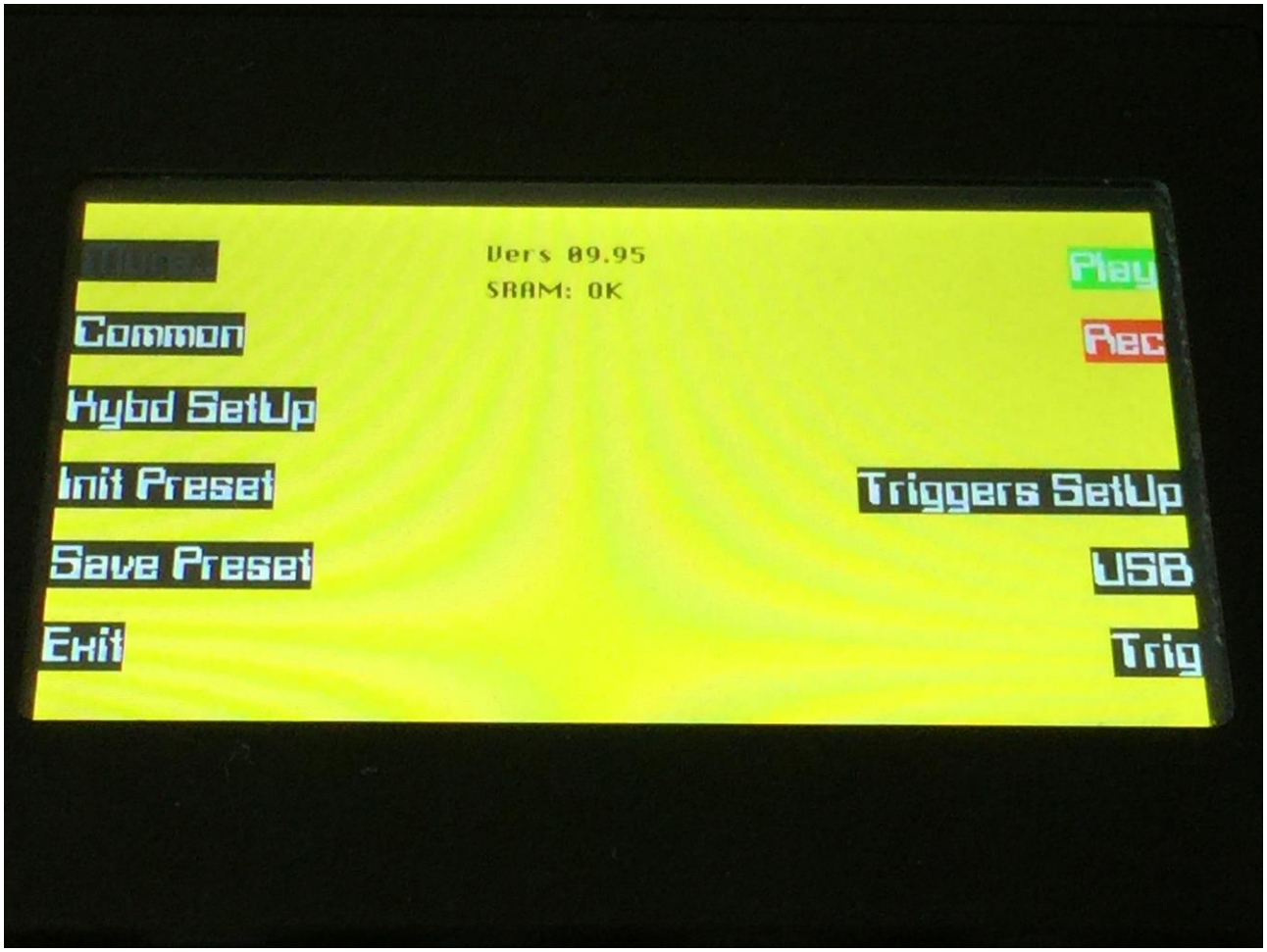
Fuzion will now ask you to confirm.

Press ”Yes” to initialize the currently selected preset and return to the previous page, or press ”No” just to exit, without initializing.

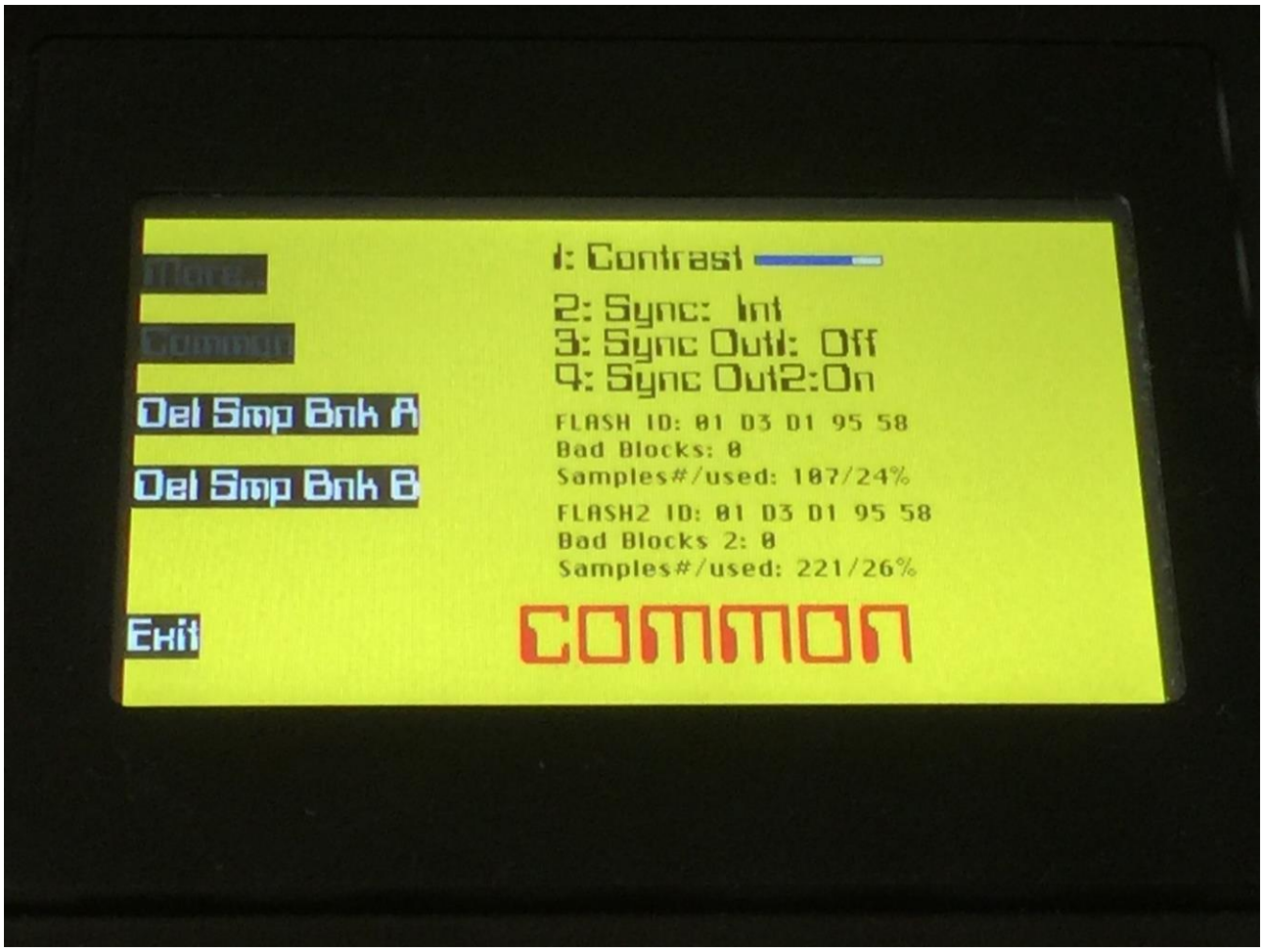
Common Settings

On this page, you can adjust the display contrast, adjust the MIDI sync settings, erase the sample banks, and check the FLASH memory.

From the Preset Select screen, push the ”More..” button, to enter this page:



Push the ”Common” button.



The following parameters can be adjusted on this page, using edit knob 1 to 4:

Contrast: Adjusts the display contrast. This setting is automatically saved, and will be remembered after a power off.

Sync: Sequencer syncronization. This setting is automatically saved, and will be remembered after a power off. Settings:
-Int: Fuzion's sequencer will be clocked internally at the rate set by the "Tempo" parameter in each preset.
-Ext1: Fuzion's sequencer will be clocked externally, by MIDI clock events applied to MIDI in 1. Sequencer play and stop can also be controlled externally.
-Ext2: Fuzion's sequencer will be clocked externally, by MIDI clock events applied to MIDI in 2. Sequencer play and stop can also be controlled externally.

Sync Out1, Sync Out2: Settings: Off, On. Select whether or not you would like Fuzion to transmit MIDI clock and start/stop events on respectively MIDI out 1 and 2. Even if Fuzion is syncing to an external MIDI clock source, it will re-transmit this, if any of these 2 parameters are on. This setting is automatically saved, and will be remembered after a power off.

Right under the 4 parameters, it is possible to check the status of the 2 FLASH memory banks, that holds the presets and samples.

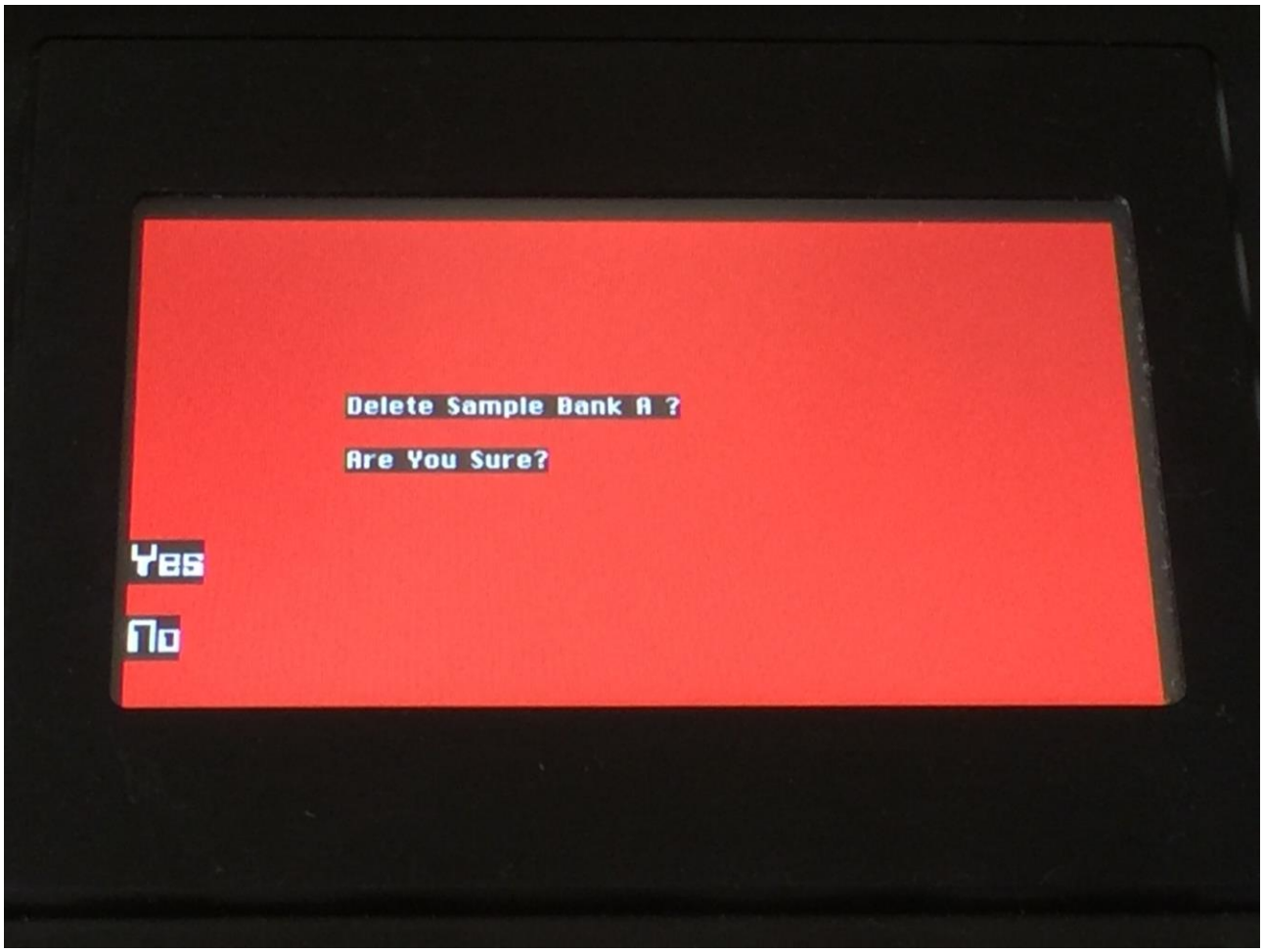
FLASH ID and FLASH2 ID should be: 01 D3 D1 95 58.

If the ”Bad Blocks” parameters measures a number higher than 20, you should back up your work, and ship your Fuzion for service. Then the FLASH memory will need to be replaced.

On the last lines you can see how many samples are hold in each FLASH memory bank, and how big a percentage that has been used. FLASH2 refers to sample Bank B.

On the Common page it is also possible to completely erase sample Bank A and B. To do that, if you are really sure, that you would like to, push the ”Del Smp Bnk A” or ”Del Smp Bnk B” button, depending on what sample bank you would like to erase.

Fuzion will now ask:



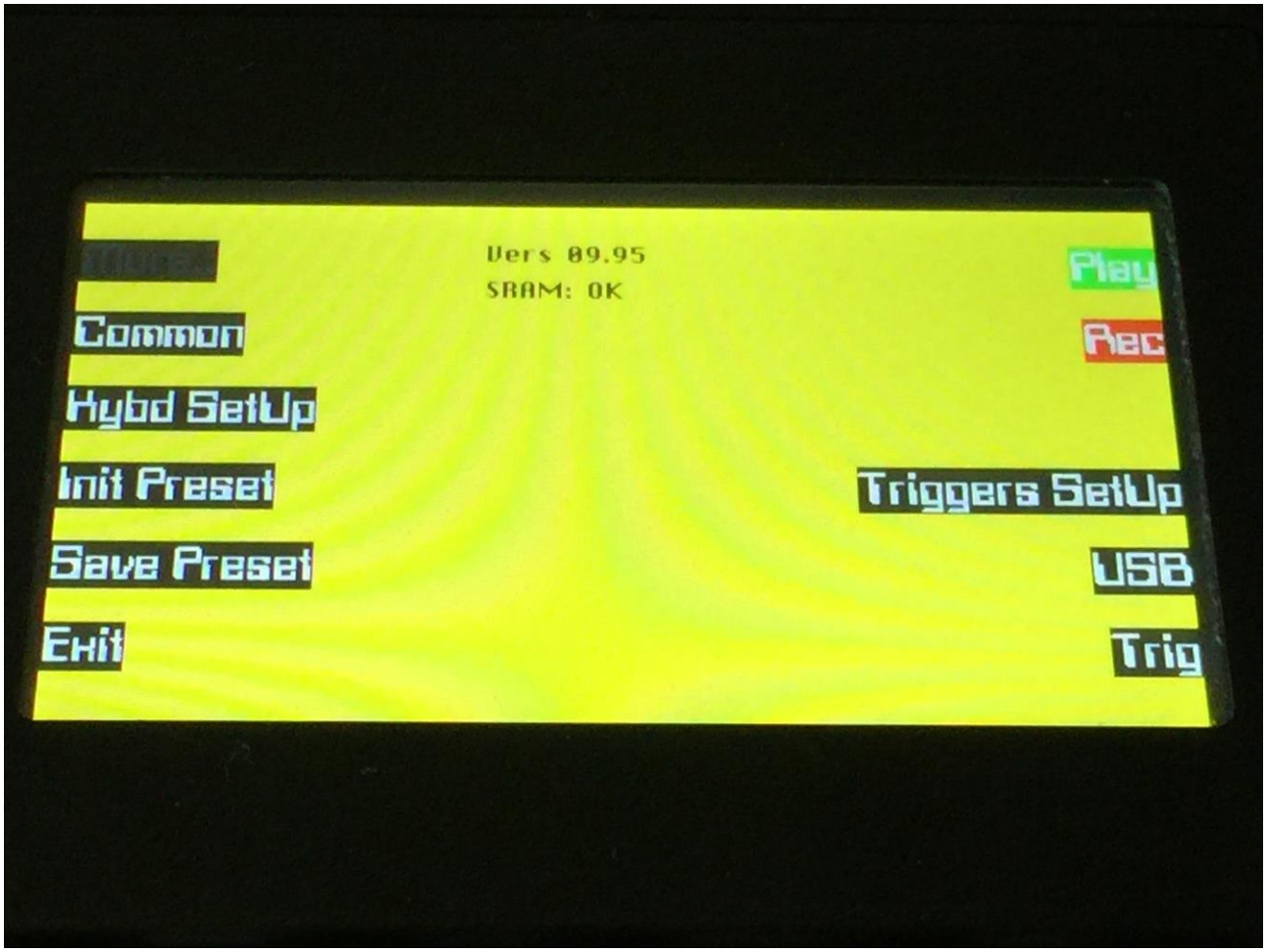
If you are really sure, that you absolutely have to do this, push ”Yes” to start the erase. The sample bank you have chosen, will now be completely wiped out. While it is being erased, the LED close to the button you pressed will flash. When it stops flasking, the erase has been done.

If you don’t want to do this anyway, push ”No” to exit.

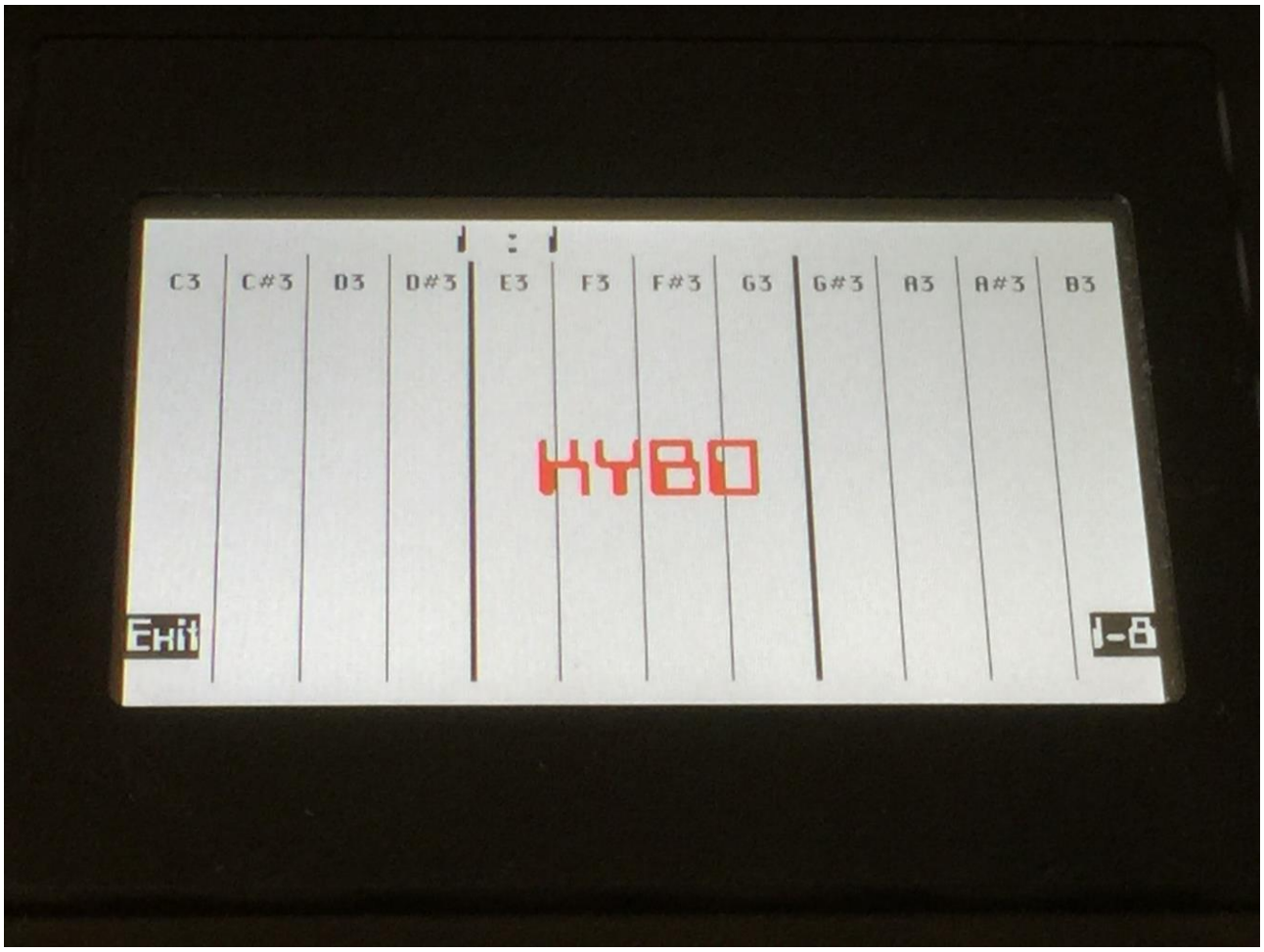
Touch Keyboard Settings

On this page it is possible to adjust which notes you would like the touch keyboard to play. Each note are adjusted separately.

From the Preset Select screen, push the ”More..” button, to enter this page:



Push the ”Kybd SetUp” button.



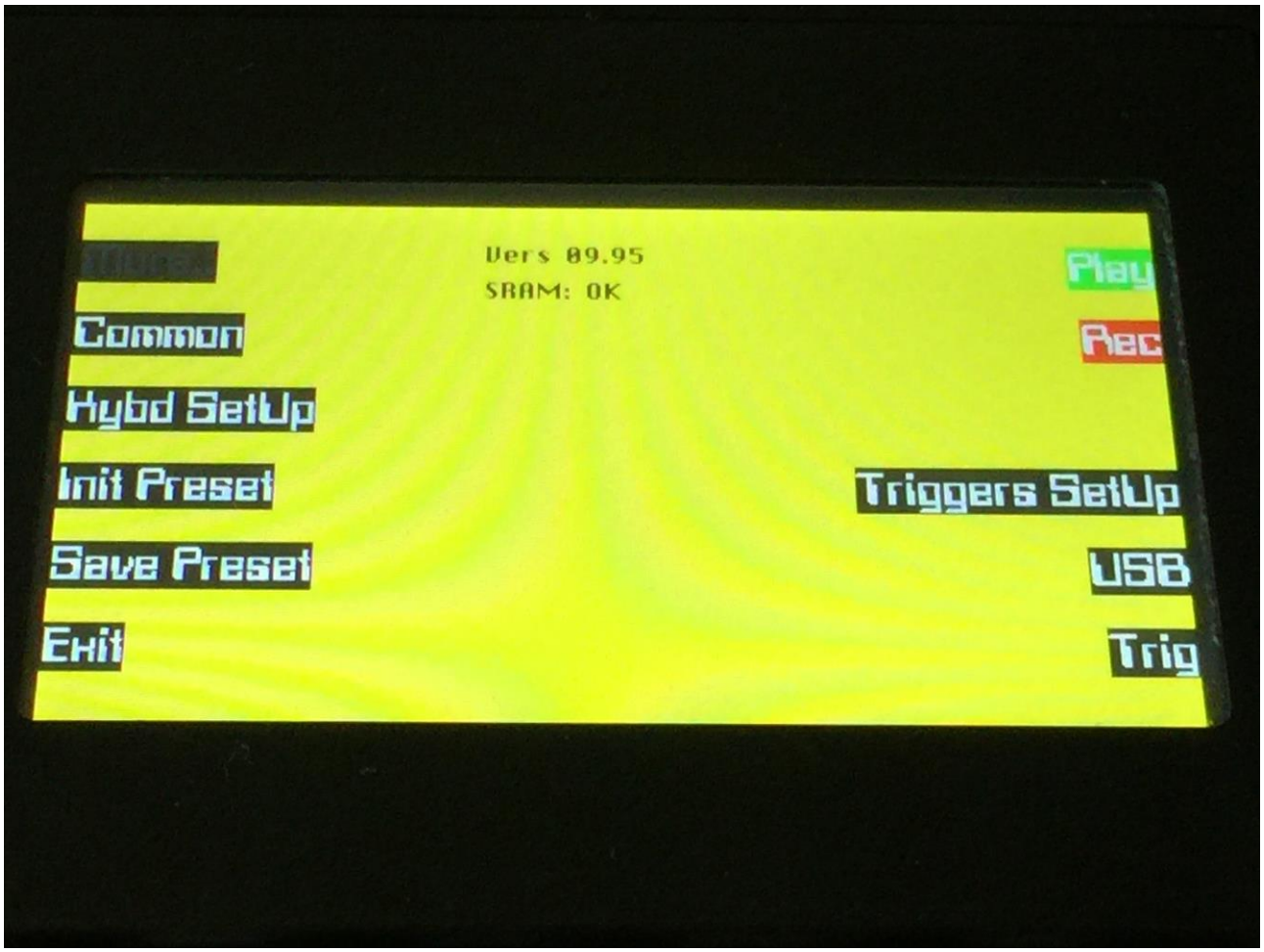
Use edit knob 1 to 8 to adjust the notes for the 8 lower keys. You can , at any time, touch the display to hear the notes. You can also just push and hold a note while you are adjusting it, to hear the changes.

Push the ”1-8” button, so it changes to ”9-12”, to adjust the notes for the 4 upper keys.

Push ”Exit” when you are done.

Checking the firmware version and effects RAM

From the Preset Select screen, push the ”More..” button, to enter this page:



In the top of this page, you can see the firmware version number currently running on your Fuzion.

If the ”SRAM” says anything other than ”OK”, the effects RAM might need to be replaced.

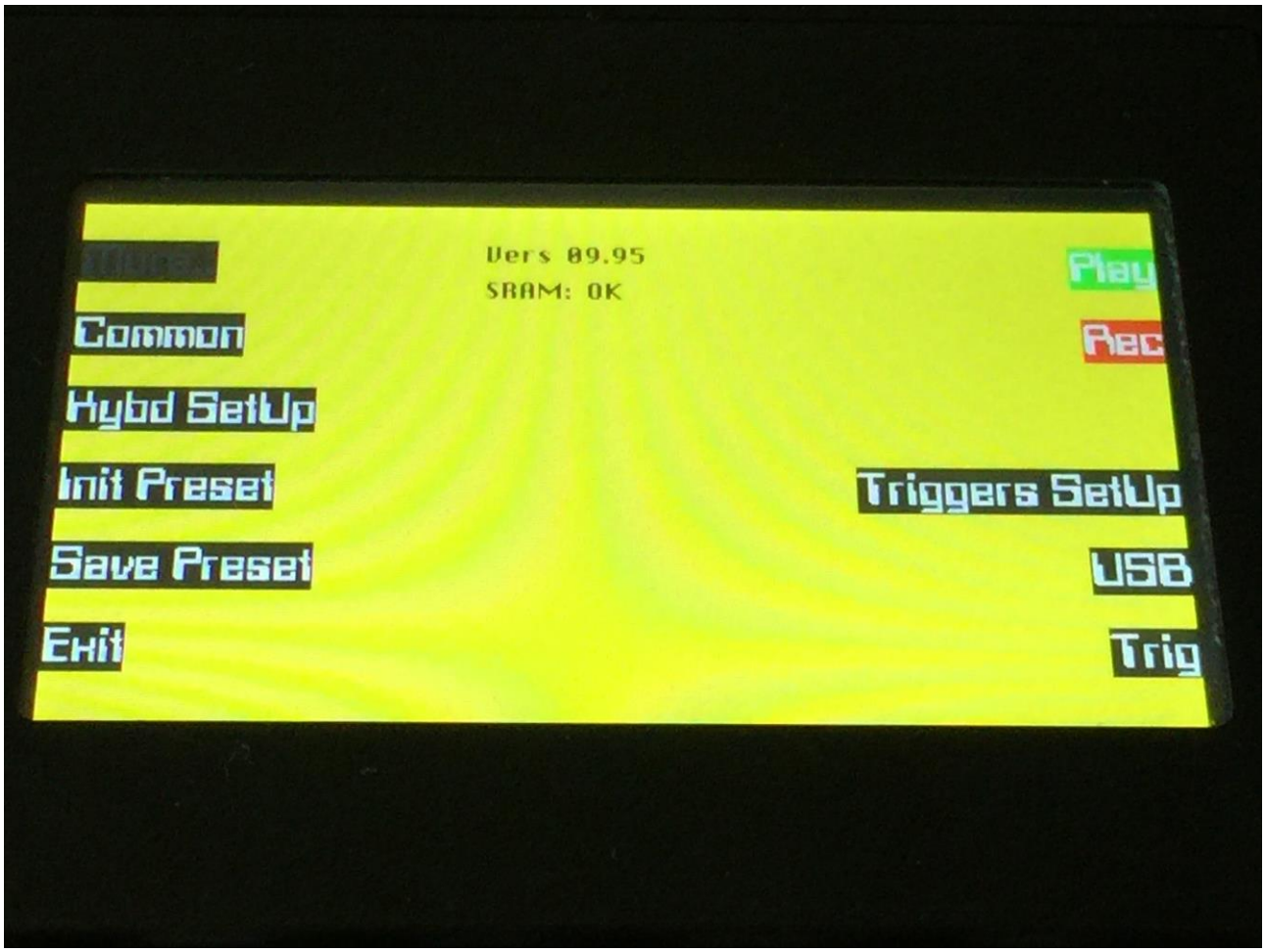
USB

The USB pages lets you access the files and directories of a USB drive, attached to Fuzion's USB connector.

You can import and export samples as .wav files, import and export presets, update Fuzion's firmware, re-name and delete files, and make new directories.

USB drives used with Fuzion should be:
-Maximum 32 GB
-DOS formatted

From the Preset Select screen, push the "More.." button, to enter this page:



Push the "USB" button.

On this first page that you will enter, the root directory of the connected drive is shown. You can see that it is the root directory, by the ”D:” in the upper left corner. If you have accessed a directory, the name of this will replace ”D:”.

If you do not see the root directory of the drive, make sure that it is connected properly, and that it is has the right specs, as described in the start of this section.

The names you see in the middle of the screen, are the names of the files and directories on the drive. File names are labelled with black, and directory names are labelled with blue. The file in the top, that has its colours inverted, are the currently selected file. To select any file or directory, use the 2 arrow buttons.

In the upper right corner, you can see how many files/directories the currently opened diretory holds. Fuzion will only show 12 files/directories at a time. When you have the 12th file selected, and then push the arrow down, it will show the names of the next 12 files, which then can be selected.

Here the 4th file is selected:

Importing files

File that can be imported to Fuzion are:

-Samples with the ending .wav
-Presets with the ending .fzp

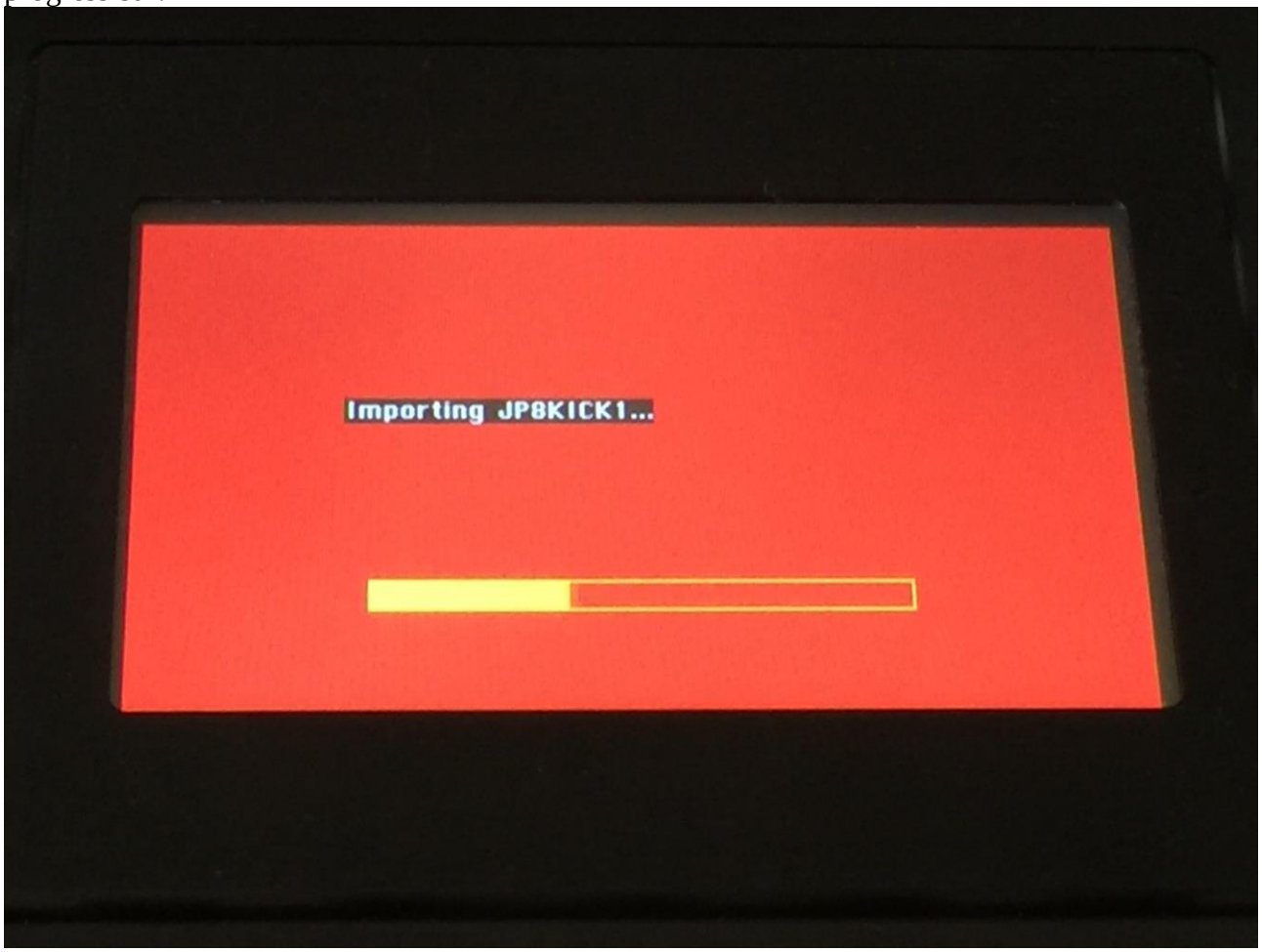
Files that are shown, but can’t be imported directly are:

-Update files with the ending .hex

Files with any other ending will not be showed on Fuzion’s screen, regardless of if they are present on the drive.

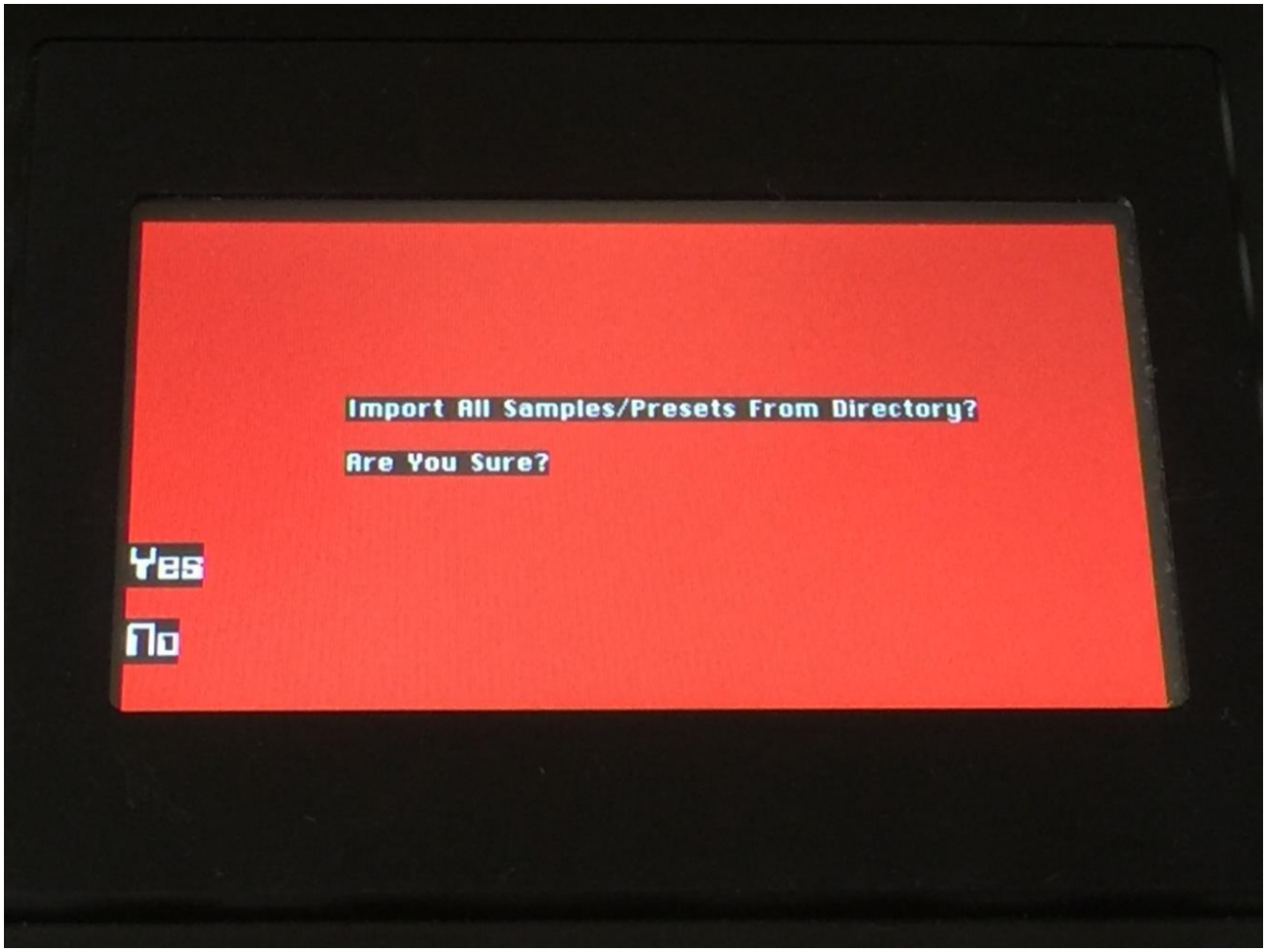
To import a single sample or preset, select the .wav/.fzp file you would like to import, using the arrow buttons.
Samples are imported to the sample bank selected on the Sample Rec page.
When importing a single preset, it is only loaded to the preset buffer, and you will have to save it manually, to keep it.

Push the ”Import” button. Fuzion will now import the selected file, and show the progress on a progress bar:



Importing multiple files

To import multiple files at one time, select a directory, using the arrow buttons. Push the ”Import” button. Fuzion will now ask:



Push ”Yes” to continue, or ”No” to exit.

If you pushed yes, Fuzion will now import all samples and presets, that the selected directory holds. It will though not import files from any sub-directories.

Samples are imported to the sample bank selected on the Sample Rec page. Presets are imported to the selected preset and forwards, so make sure that you have not selected a preset that you planned to keep, before using this function.

Open a directory (or folder)

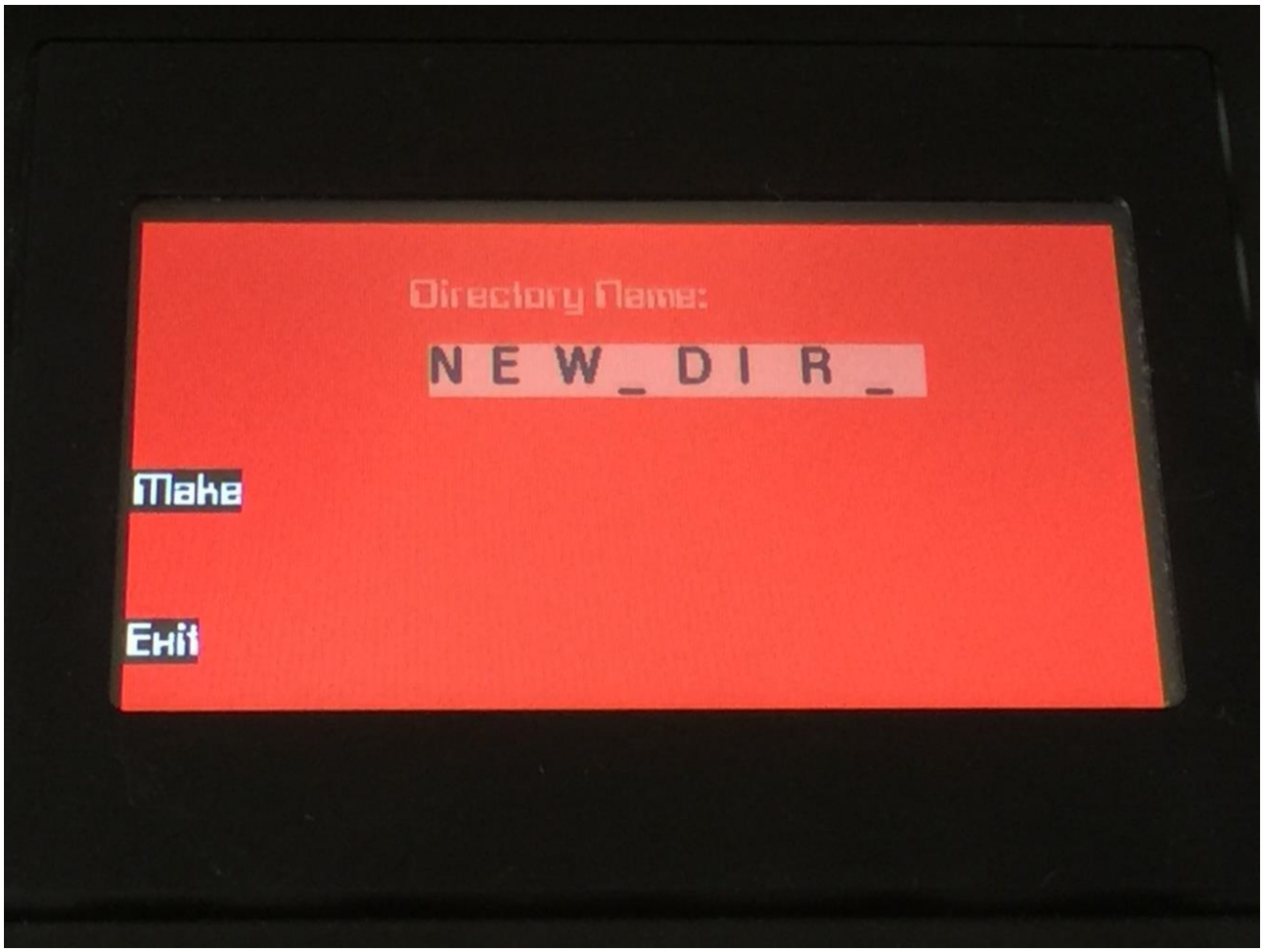
To open a directory, to see what's inside, or to import single files or sub-directories, simply select the directory you would like to open, using the arrow buttons, and then push the "Open" button.

Fuzion will now open the directory, and show the first 12 files in it. The "D:" in the upper left corner, will now be replaced by the opened directory's name:

Make a new directory

A new directory can be created in the root directory, or inside another directory.

To do this, push the ”Make Dir” button.



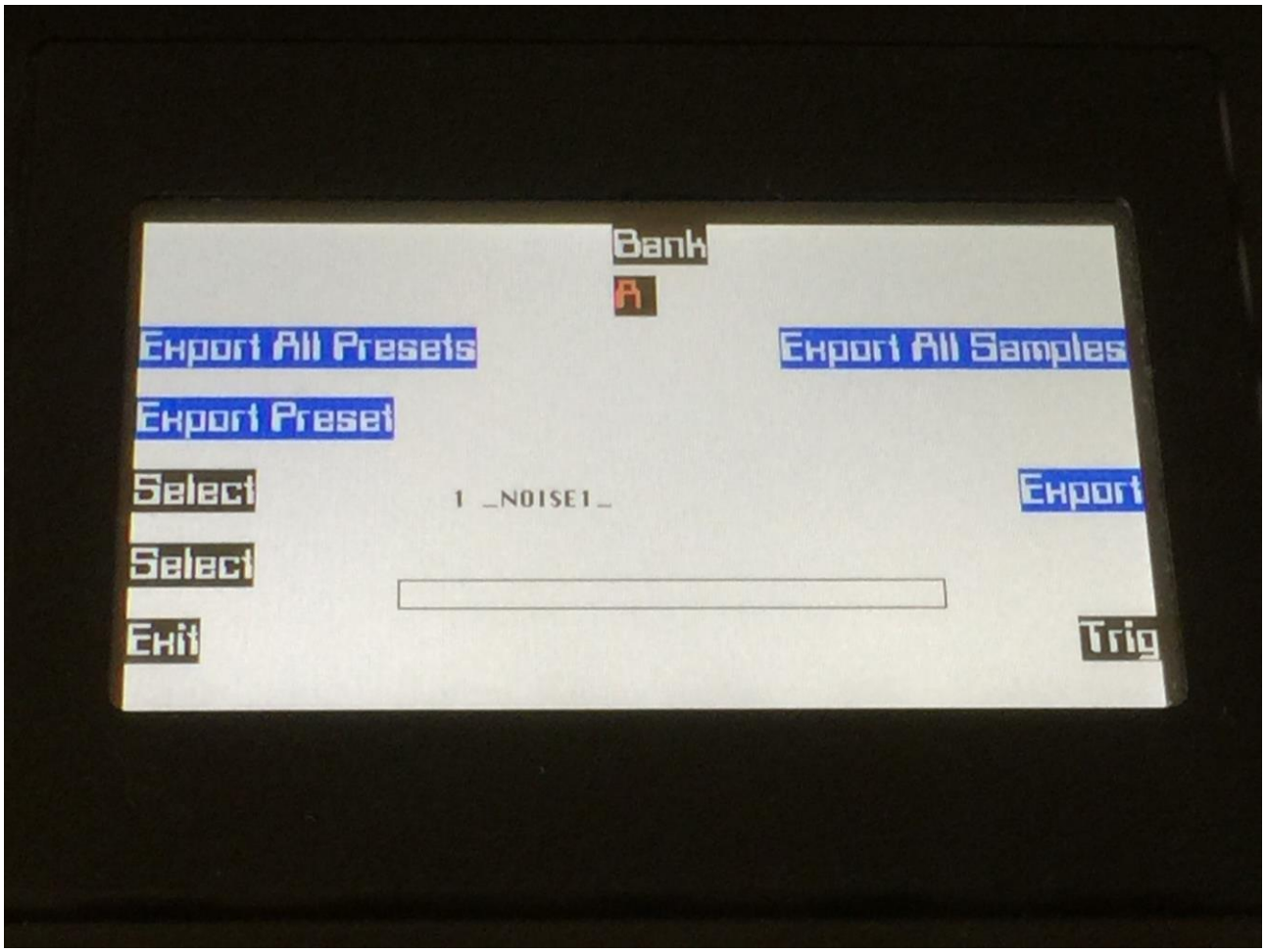
The 8 edit knobs can now be used to select an 8 character name for the new directory. When you are done with this, push the ”Make” button. The new directory will now be created.

You can, of course, also just push ”Exit”, if you do not want to make a directory anyway.

Export samples and presets to a USB drive

The samples and presets held in Fuzion's FLASH memory can be exported to a USB drive, for back-up, or for use with other gear or computers. Fuzion exports samples as standard 16 bit, 44.1 KHz, native PCM .wav files, so they can be used with any other gear, that supports this format. Fuzion exports presets in its own .fzp format, so these can at writing moment only be used by Fuzion itself.

To enter the export page, push the "Export" button:



All exports are done to the currently open directory. There are 4 different possibilities for exporting:

"Export"
Pushing this button will export the selected sample. Use the 2 "Select" buttons to select the sample to be exported, use edit knob 3 to select the sample bank, and use the "Trig" button to audition the sample before export.

"Export All Samples"
Pushing this button will export all samples of the selected sample bank. Use edit knob 3 to select the bank for export.

”Export Preset”
Pushing this button will export the currently selected preset.

”Export All Presets”
Pushing this button will export all programmed presets.

Rename a file

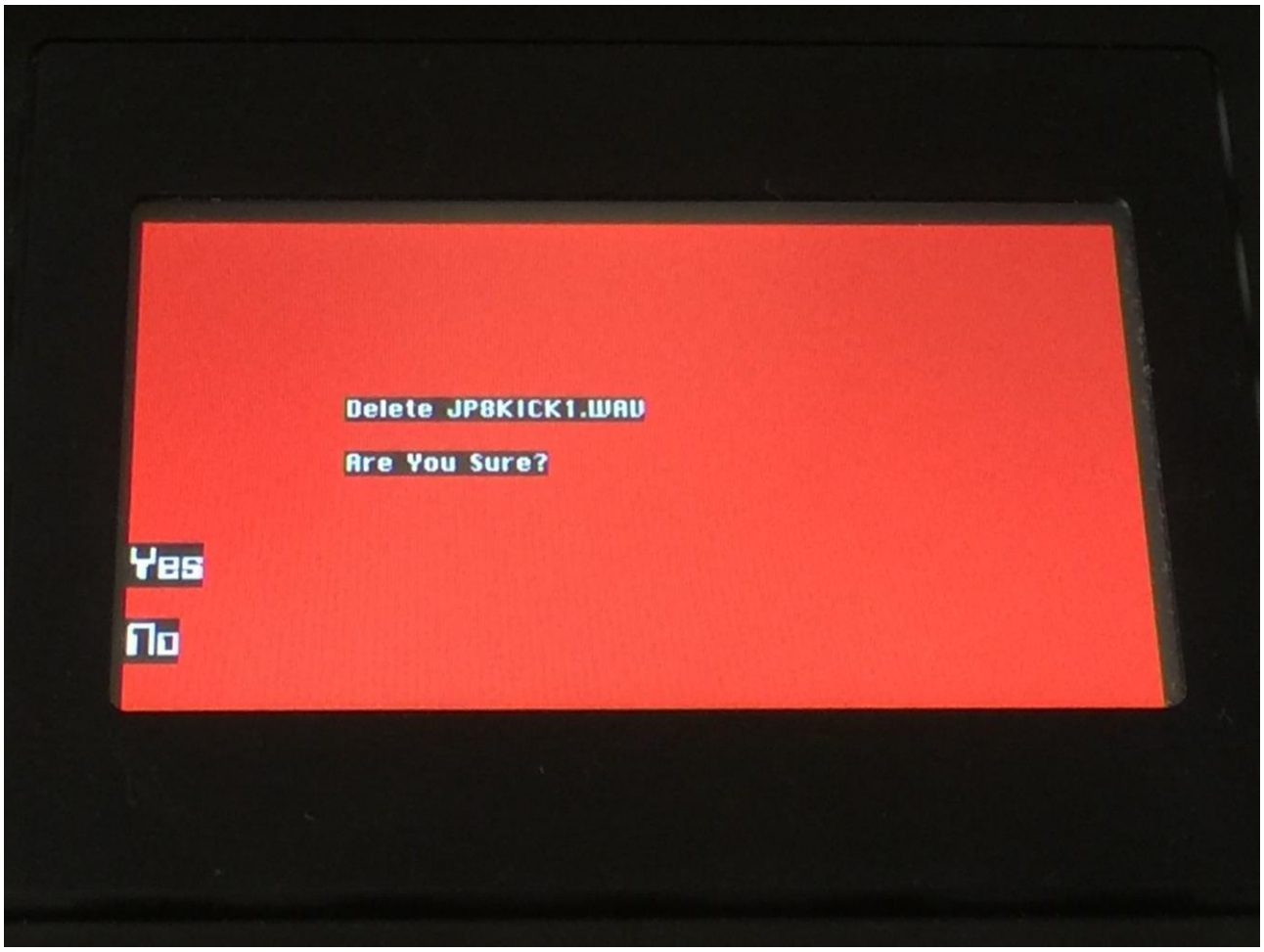
It is possible to rename files on the USB drive. Only files can be renamed, not directories.

To do this, select the file you would like to rename using the arrow button, and push the ”Rename” button to enter this page:

Use the 8 edit knobs to enter a new name for the file. Push the ”Rename” button, when you are done.

Delete a file

To delete a file on the USB drive, select the file you would like to delete using the arrow buttons, and push the ”Delete” button. Only files can be deleted, not directories. Fuzion will now ask:



Push ”Yes” to confirm or ”No” to exit.

Updating Fuzion's firmware

Now and then updates will be available for Fuzion, that adds new functionality and fixes bugs. These will always be available for download here:
http://www.gotharman.dk/fuzionupdates.htm

So to update Fuzion, you must have a computer with an internet connection, and a Fuzion compatible USB drive ready. See the start of this section, for what USB drives are Fuzion compatible.

Then you should follow these steps:

1. Download the 3 update files of the latest update, from the Fuzion Updates site, to your computer.

2. Connect the USB drive to your computer.

3. Make sure that the USB drive is DOS formatted.

4. Create a directory in the root directory of this USB drive, that is named "UPDATE".
If the USB drive already contains a directory called UPDATE, please delete all files inside this.

5. Copy the 3 update files from your computer to the USB drive UPDATE directory. Make sure that no other files are present in this folder, and please don't rename the files.

6. Eject and remove the USB drive from your computer, and connect it to Fuzion's USB connector.

7. Turn Fuzion on, if it isn't already turned on.

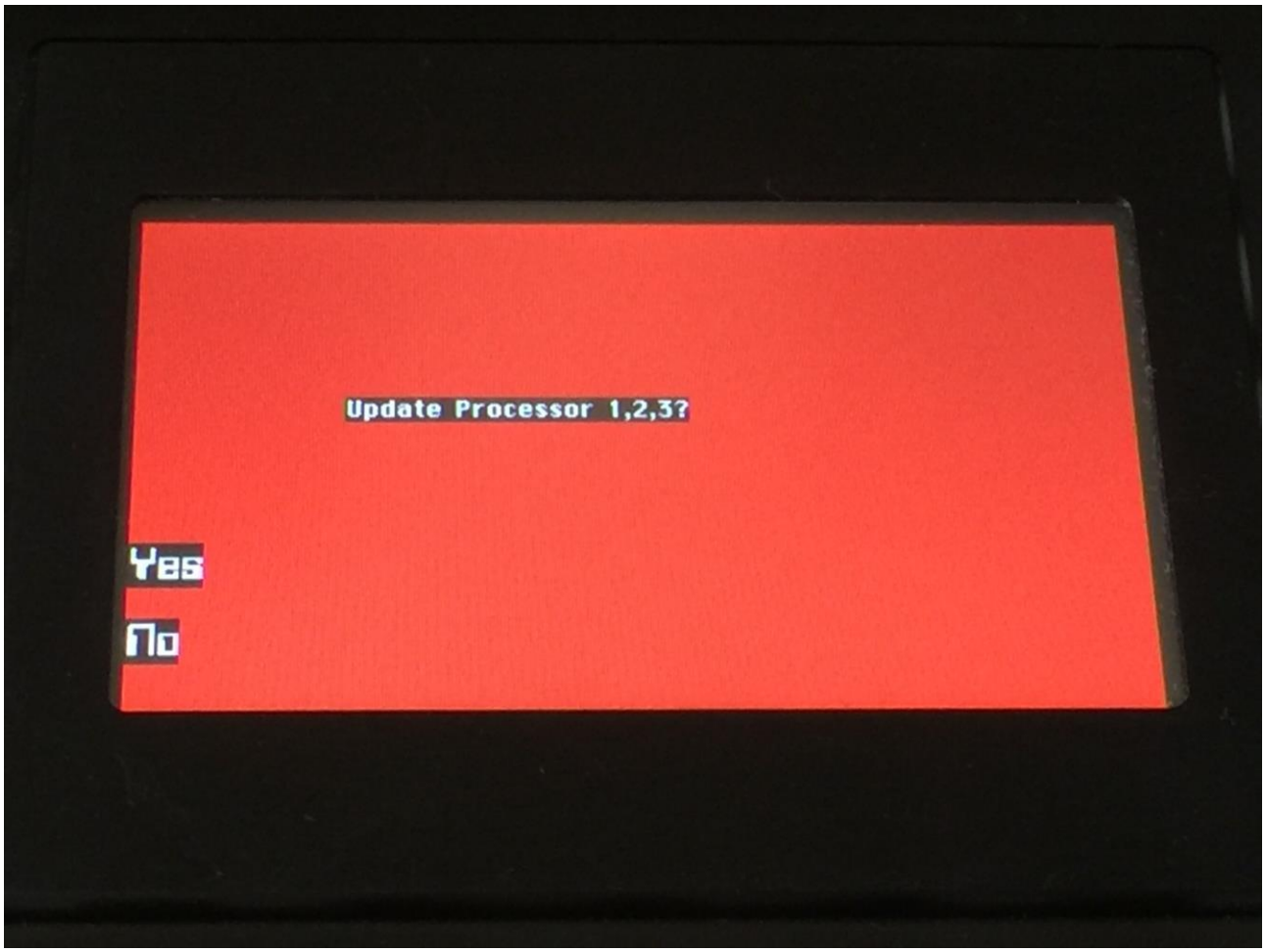
8. From the preset select screen, push the "More.." button.

9. Push the "USB" button.

10. Wait for Fuzion to register the USB drive, so all files and folders are presented on the screen.

11. Push the "Update" button.

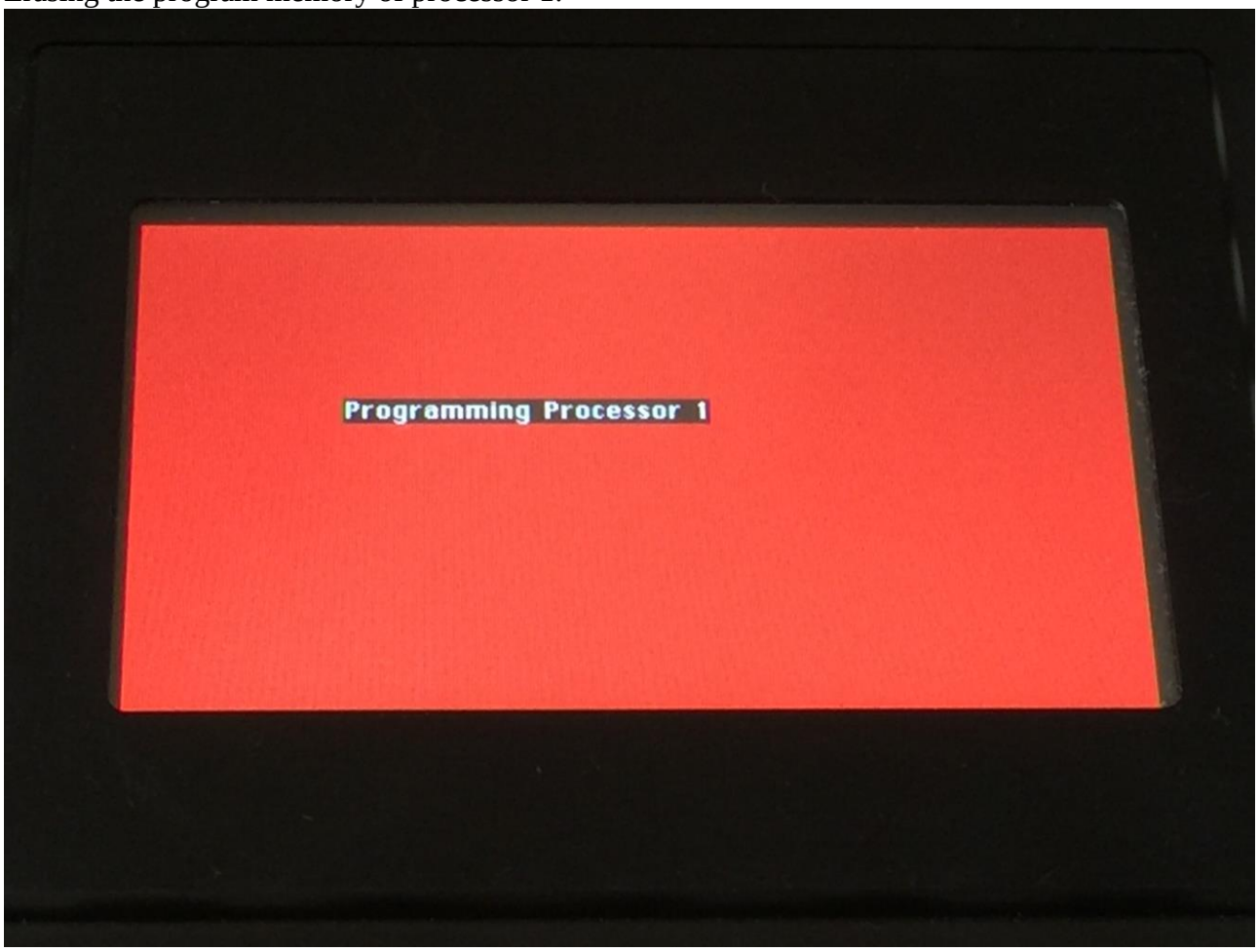
12. Fuzion will now search for the "UPDATE" folder and valid update files. If it finds both, it will ask: "Update processor 1,2,3?"



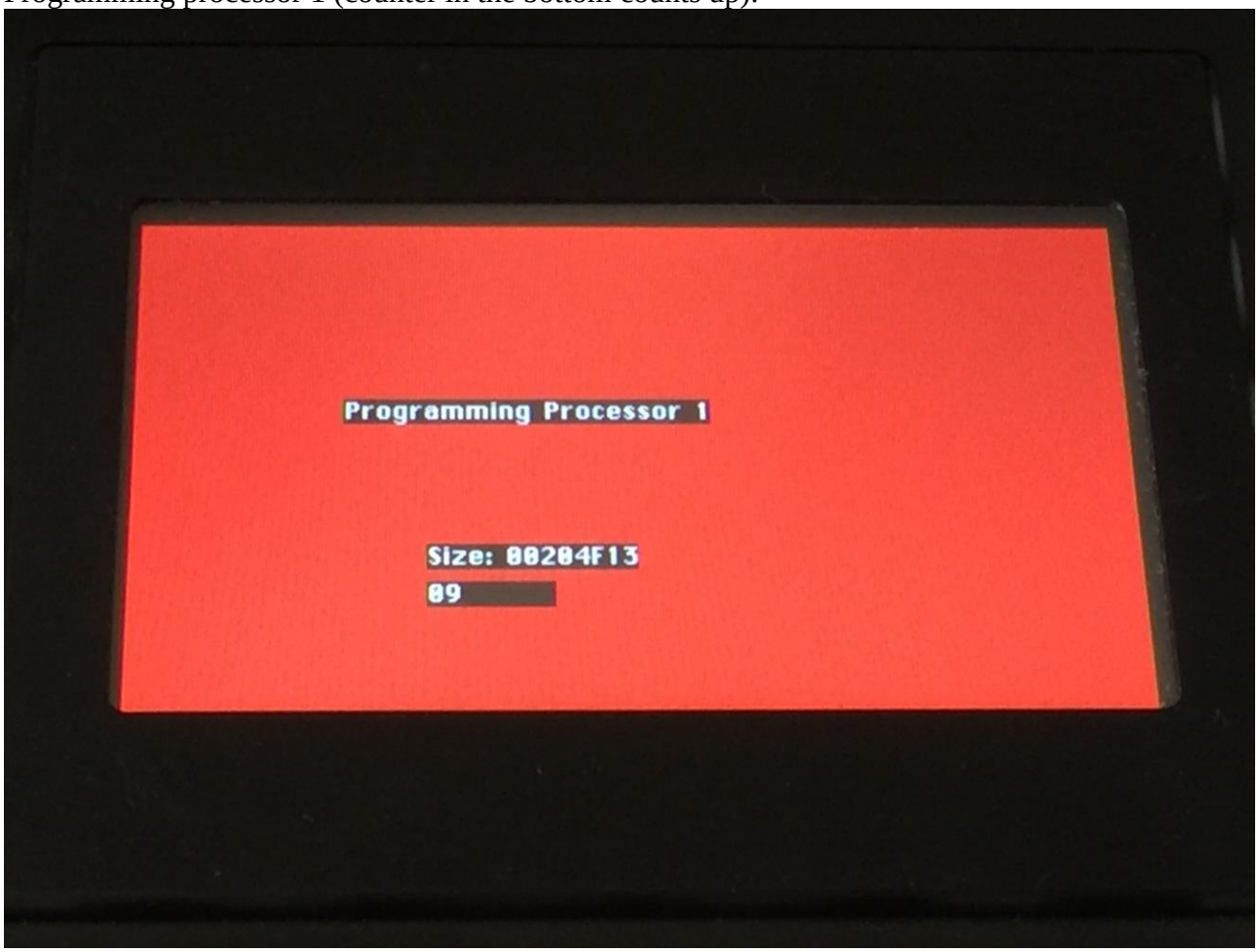
13. Push "Yes" to proceed with updating, or "No" if you regret.

14. If you pushed Yes in step 13, Fuzion will now start to get the update files, and program its 3 processors.
Every time it starts to program a processor, it will look like it halts for a couple of minutes. This is because it does halt, when erasing the program memory of a processor.

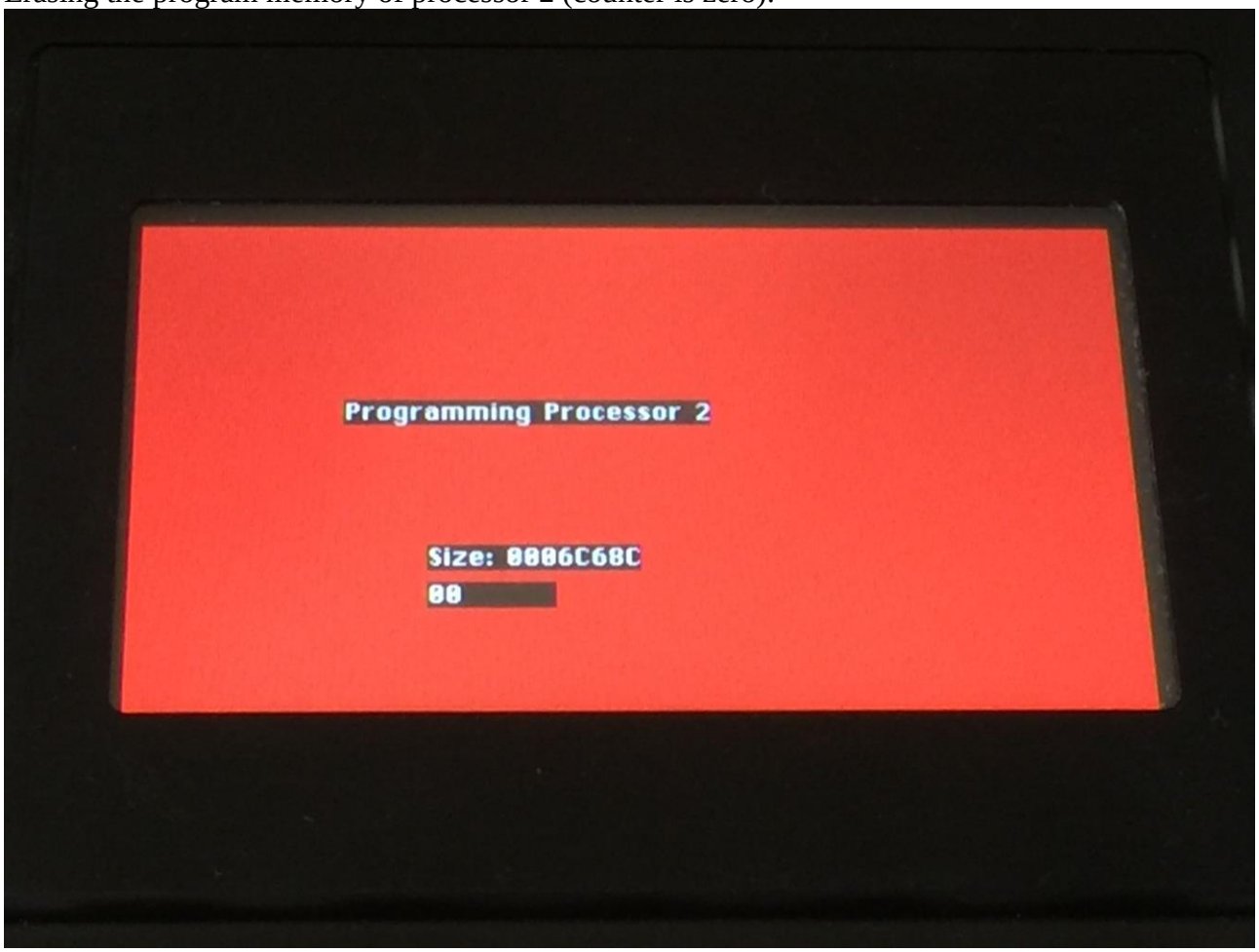
Erasing the program memory of processor 1:



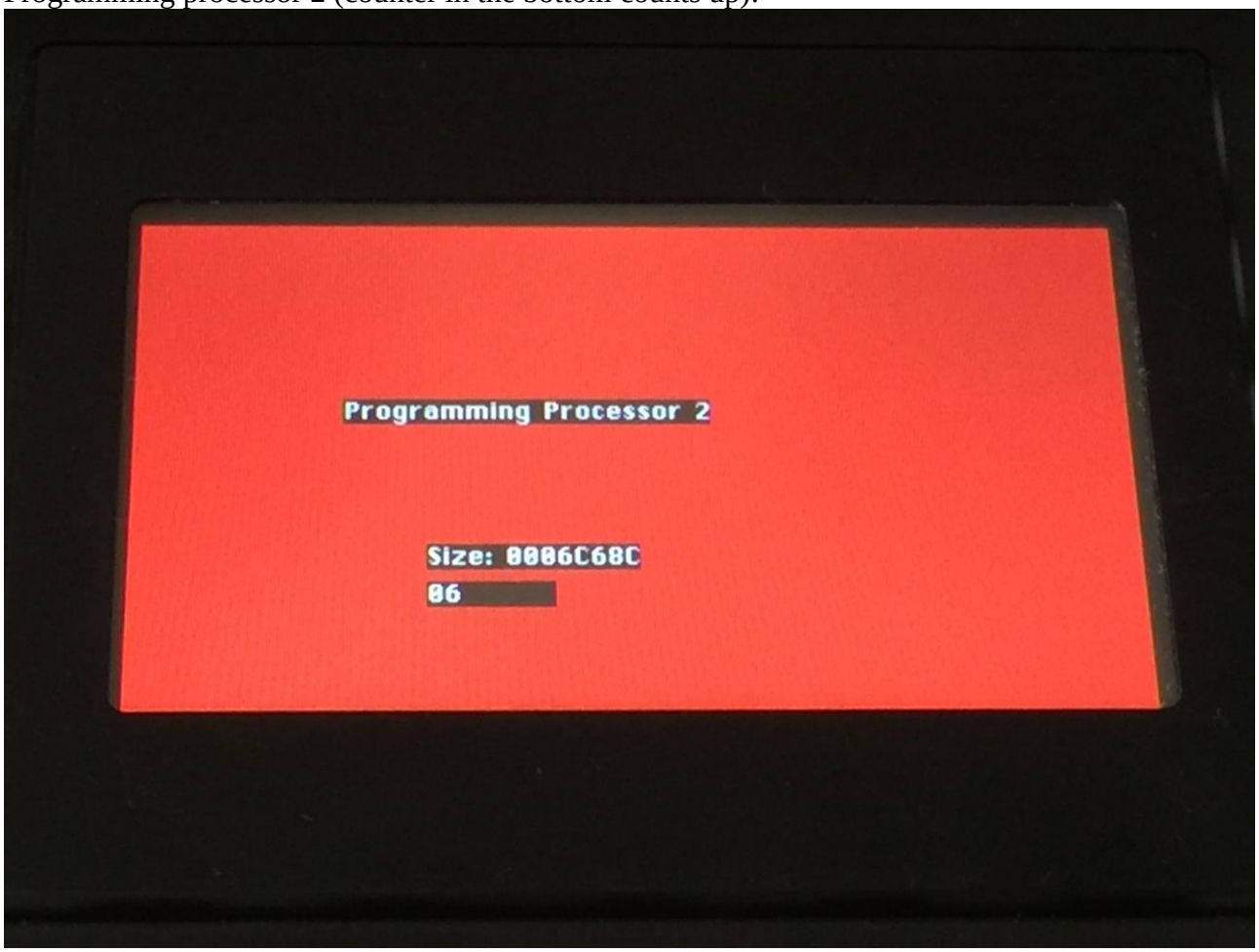
Programming processor 1 (counter in the bottom counts up):



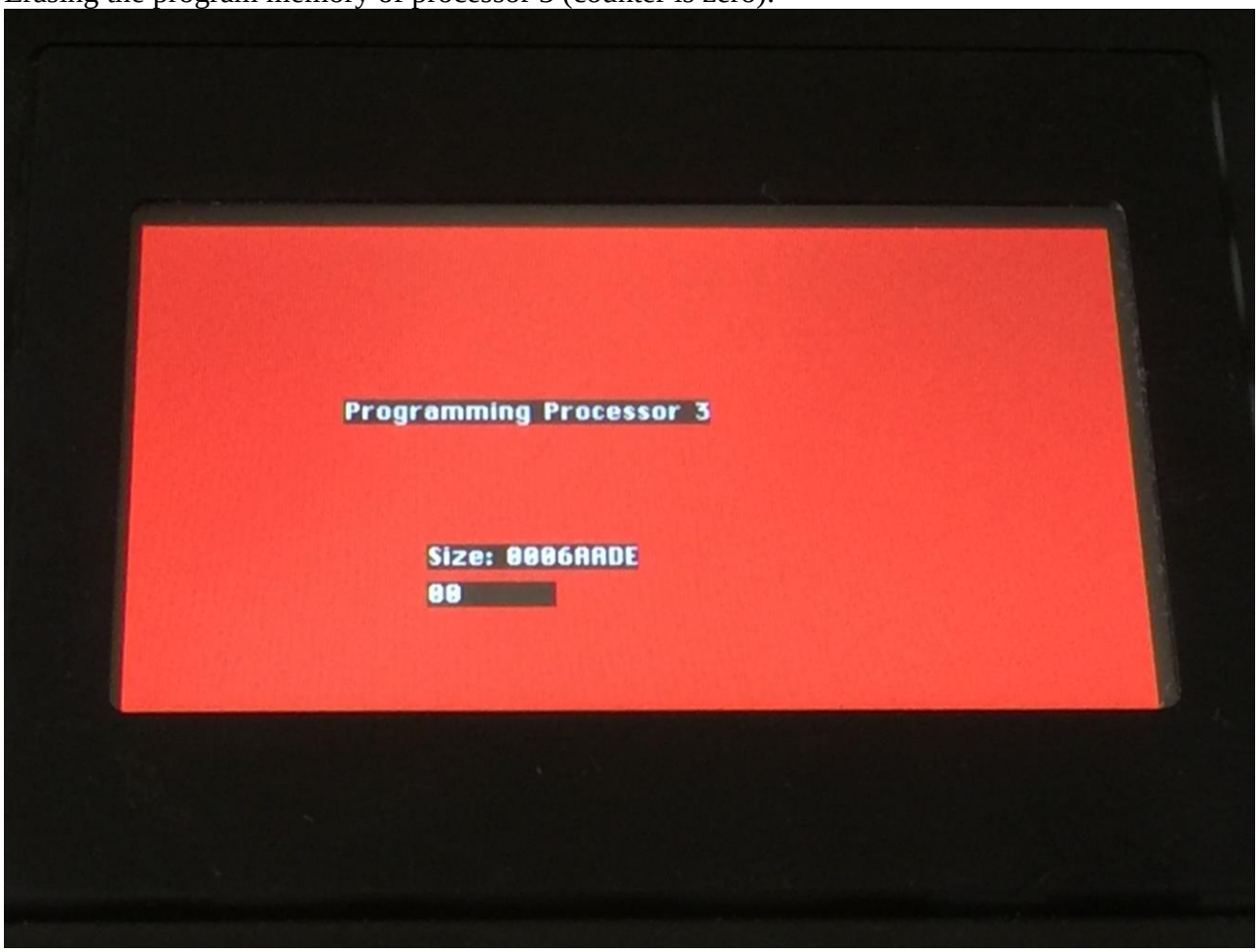
Erasing the program memory of processor 2 (counter is zero):



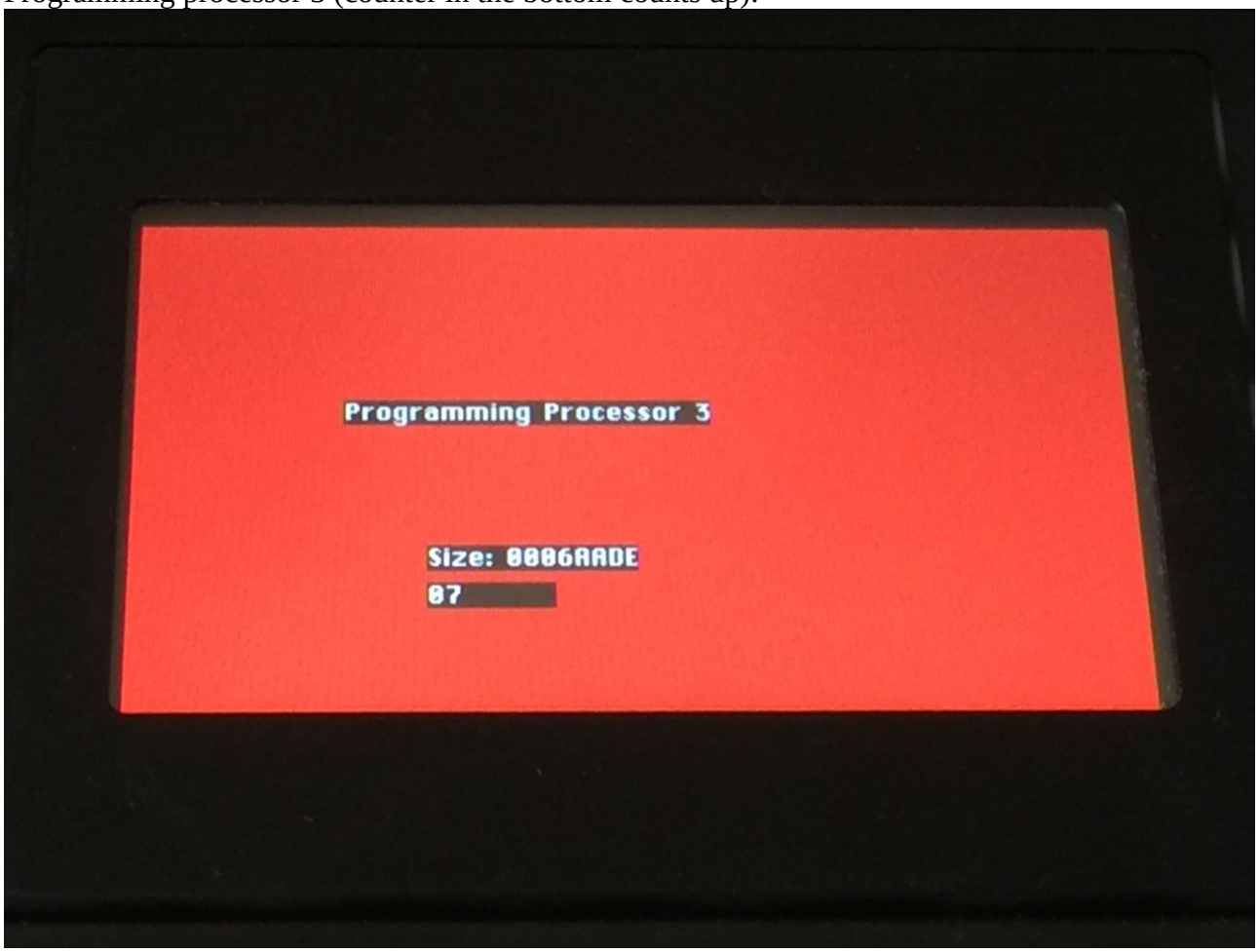
Programming processor 2 (counter in the bottom counts up):



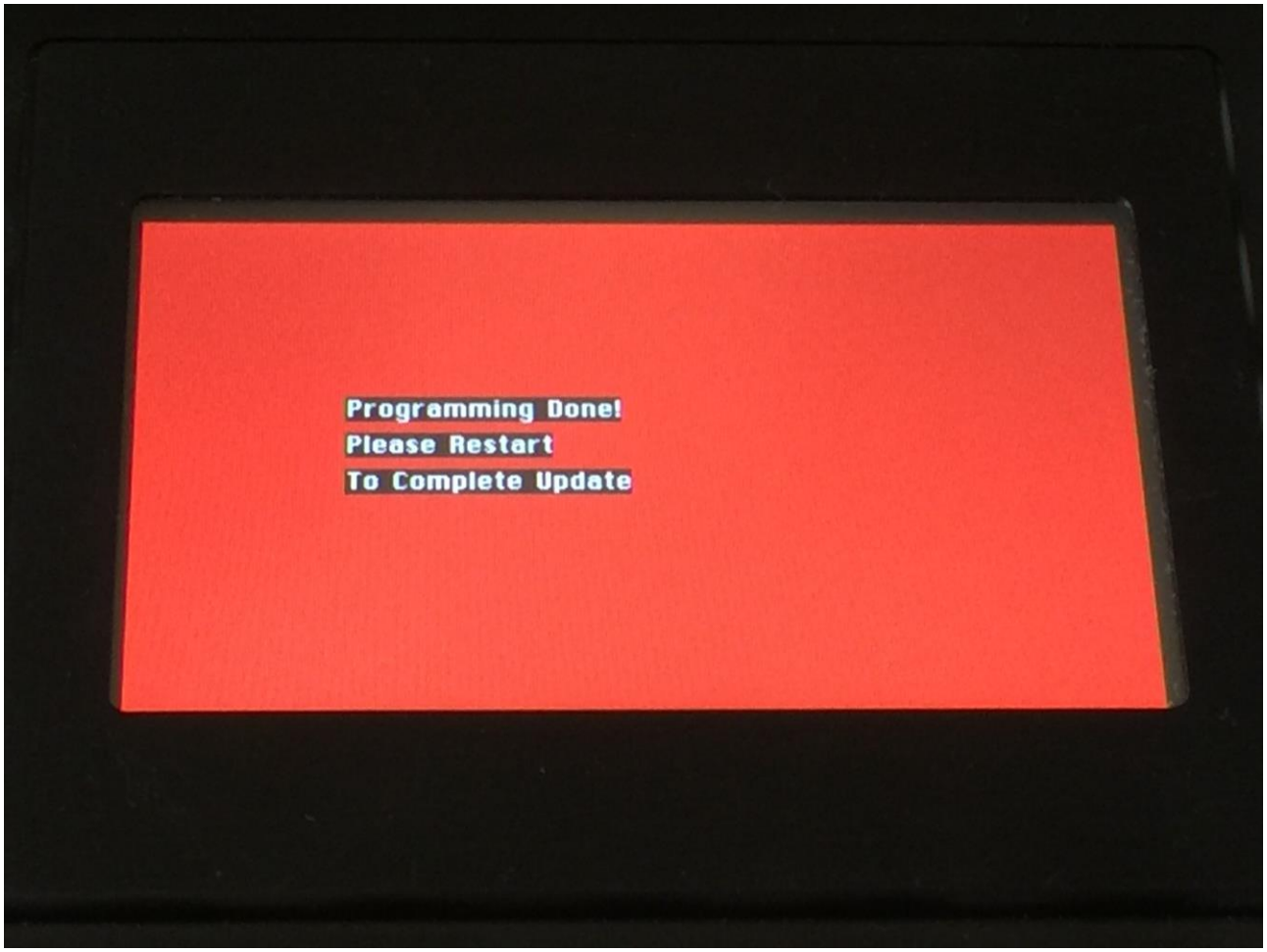
Erasing the program memory of processor 3 (counter is zero):



Programming processor 3 (counter in the bottom counts up):



15. When programming is done, Fuzion will ask you to restart it. Please turn Fuzion off and then on.



16. When you turn on Fuzion after an update, it will need to finalize this. It will show this by turning on all its LED's one by one. When all LED's has been turned on, they will turn off, and Fuzion will start normally and are ready to use.

Sometimes Fuzion might not start up normally, right after an update. If anything on the display looks incorrect, if Fuzion outputs sound without any reason, or if you experience any other abnormal behavior right after an update, please turn Fuzion off and on again.

If something goes wrong:
-If the power should go off, while Fuzion is getting the update from the USB drive, and programming the processors, simply start over again from step 7.
-If the power should go off, while Fuzion is finalizing the update (LED's turn on), simply turn Fuzion on again, and it will now finalize the update. If one update was already finalized, it will come up with some warnings, the processor x updating failed. Simply ignore these, and turn Fuzion off and on again.

Written by
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”Gotharman”
2015

www.gotharman.dk